THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

As with every move it has made in the past six months the dissolution of the Southern Pig Iron Association had been foreshadowed by market developments. The last meeting, held at Birmingham early in the month brought out charges of price cutting and the peace patched up had little promise of permanence. Two things of more immediate interest than the news of the break up of the association are the sale of considerable accumulated iron at Southern furnaces at prices below those of recent weeks, and the taking of steps looking to the renewed exportation of Southern pig iron. The formal disruption of the association was followed by the widespread quotation of $10.50 Birmingham on No. 2 foundry iron, and the sale of 20,000 tons of iron by one interest holding the largest stocks. Much of this iron went to Chicago and other Western districts, and all members of the association made freer sales than in months. The level reached in this open competition is not entirely clear, but producers are known to have made a price of $10.25 at furnaces from which the freight to the North is 25 cents less than from Birmingham, thus making the equivalent of $10 Birmingham. No exports have yet been made, but negotiations are under way. The lowest freight rate yet quoted on export iron from Birmingham (early November sailing) is $3.25, as against a range of $2.50 to $4 in the last export movement. With the $2.50 rate, which should be again available in case any considerable export movement is assured, No. 3 iron from Birmingham could compete in Manchester, Eng., if sold at about $9 at furnace. The status of the curtailment movement among Southern furnaces is not definitely known. This was undertaken by the associated furnaces and their committee is at work, but the breaking up of the association may make a difference. The furnaces in the Pittsburg and Valley districts have entered vigorously upon the program mapped out, nine having been blown out or banked in the past week, making 21 now idle in Ohio, Allegheny county and Wheeling. Northern furnaces will now be compelled to reduce prices if they meet the Southern competition on the newly established basis, No. 2 Southern iron having been sold delivered in Northern Ohio at $14.10. In the Pittsburg district No. 2 foundry has sold at $14.75. Bessemer iron is inactive and likely to continue so through the year. Steel works stoppages are increasing in number, a considerable addition being made in the week to the idle Bessemer and open-hearth capacity. The effect of railroad cancellations has been felt in many directions, and there is so general a disposition to hold new work in abeyance that orders and specifications in most finished lines have pinched down to small proportions. As yet the parties to agreements, as in structural shapes, plates and steel bars, have not thought that lower prices would be any stimulus to business. Bar iron and sheets appear to be the weakest members on the list, the former selling at 1.45c and a shade lower, and the latter close to 2.60c for No. 28 in Western markets. Wage readjustments have been discussed but there is no general move toward reductions. Sliding scale arrangements will bring lower rates in some finished lines, as bimonthly settlements are made.

PITTSBURG.

OFFICE OF *The Iron Trade Review*, 429 PARK BUILDING, Oct. 21.

The pig iron curtailment program in this and the Valley districts is already under way, nine furnaces having been added to the idle list in the week. Of this number the steel corporation operates seven, and independents two. In the week previous three furnaces went out, making a total of twelve that have been blown out since the adoption of the curtailment policy. In addition there are nine idle stacks in these districts that have been undergoing repairs for some time, making a total of twenty-one idle furnaces. This list will no doubt be augmented before another week, and by the end of the month some of the stacks now idle will resume and other furnaces now in operation will blow out.

The list of idle steel plants still continues large and was increased on Saturday, Oct. 17, by the shutting down of the Ohio plant of the Carnegie Steel Co., at Youngstown, O. It is not definitely known whether this plant will resume operations next week, although it is reported that it will. Other steel plants are idle at Bellaire, O., Sharon, Pa., and Duquesne, while none of the finishing mills of any of the large steel concerns in this district are operating in full.

Despite the shutting down of so many steel works and blast furnaces, the production of pipes and tubing, tin plate and wire and wire nails, promises to be greater this year than ever, and production in these lines continues at a heavy rate. While a number of tin plate mills are idle at present, this was fully expected, and owing to the tremendous consumption during the last nine months it was believed that, with the general falling off in the iron trade, more mills would be compelled to shut down than is the case. Structural, plate and bar mills are exceedingly quiet, and as an enormous tonnage of steel is consumed by these mills, the falling off in consumption is the more keenly felt. In none of these lines has the market shown any change during the week, and what orders are being received are for small lots for immediate shipment.

The dissolution of the Southern Pig Iron Association will undoubtedly result in still lower quotations on Northern brands, although Northern furnaces are not disposed to shade present quotations. While some of the former association furnaces are asking $10.50 to $10.75 for No. 2 foundry, Birmingham, others are quoting $10.25, and $10 could no doubt be done on a desirable tonnage. Southern forge is held at $9.25 Birmingham, but $9 could readily be done on a large order. The majority of Northern furnaces are quoting $14.75 to $15.25 for No. 2, Pittsburg, but coke dealers, who are taking pig iron in payment for high priced coke, have sold small lots of No. 2 in the week at $14.25, and one sale of forge is reported at $13.75. Bessemer iron continues nominally at $15 at the furnace, but this price could be shaded 25 cents a ton on a desirable order.

Independent coke dealers and manufacturers in the Connellsville region have been trying to form an association to regulate prices, but it is doubtful if an organization will be effected for the reason that several of the largest independent operators in the region have refused to co-operate. Prices of Connellsville furnace coke have fallen in the meantime and leading producers are now quoting from $1.75 to $1.85. The produc-

tion in the upper and lower Connellsville region has fallen off fully 50,000 tons a week, and additional ovens are being put out daily.

Pig Iron.—In the past week the Carnegie Steel Co. blew out two stacks at Bellaire, O., one at Niles, O., and two at the Isabella plant, Pittsburg. Two stacks at the Ohio plant, Youngstown, O., were banked. The Byers stack at Girard, O., was blown out, as was also one of the furnaces of the Clairton Steel Co., Clairton, Pa. In addition the following furnaces are out: No. 3, Ohio Works Carnegie Steel Co., Youngstown, O.; two furnaces of the Carnegie Steel Co. at Sharon, one at the Isabella plant at Pittsburg, and two Edgar Thomson stacks; Laura, of the Republic Iron & Steel Co., at Haselton, O.; Mary, at Lowellville, O.; Alice, at Sharpsville, Pa.; Shenango Furnace Co., No. 3, at Sharpsville; Mabel, at Sharpsville, and one stack at Hubbard, O. The buying of foundry iron continues in small lots for immediate requirements and consumers are not covering for future needs, despite the low prices that are being quoted. As a result of the dissolution of the Southern Pig Iron Association, Southern No. 2 is being offered here at $14.60 to $14.85, while on a desirable order $14.35 could be done. Southern forge is being offered at $13.60 on ordinary lots. Bessemer iron continues to be held nominally at $15 at the furnace. Virginia furnaces are meeting the quotations of Birmingham sellers in the Pittsburg district, and owing to the low freight rate of $2.55, can make more attractive quotations than any of the Southern furnaces. We quote as follows:

Bessemer Valley	$15 00 to 15 25
Bessemer, Pittsburg	15 85 to 16 10
No. 1 Foundry	15 25 to 15 50
No. 2 Foundry	14 75 to 15 00
Gray Forge, Pittsburg	13 75 to 14 00
Chilled Basic, Valley	15 00 to 15 25
Chilled Basic, Pittsburg	15 85 to 16 10

Steel.—The list of idle steel mills in this district has been increased by the shutting down of the Ohio works of the Carnegie Steel Co. of Youngstown, O., and while it is rumored that still another plant will shut down for a brief period, there is nothing definite at this time. Bessemer billets are marketed in small lots on resale at $26, Pittsburg, while open-hearth steel is being quoted at the same price by some of the independent steel mills. None of the concerns in the steel association are shading prices, and it is understood no action will be taken with regard to a change of prices unless the general market settles still further. Pool quotations continue as follows: Bessemer billets 4x4 inches and slabs up to and including .25 carbon, $27, Pittsburg, Wheeling or Valley, Johnstown, Ashland, Ky., Ironton, O., and Lorain, O.; .26 to .60 carbon, $1 advance, and .61 to 1.00 carbon, $2 advance; open-hearth billets up to and including .60 carbon, $28, and over .60 carbon, $29; billets smaller than 3⅞-inch and sheet and tin bars are $1 per ton extra; Bessemer rods, $35.50 to $36 and open-hearth are held at $1 advance.

Ferro-Manganese.—Both foreign and domestic manganese, 80 percent, in 50-ton lots and over is held at $48 per ton, delivered at buyer's mill east of the Mississippi river. Carload lots continue to be quoted at $48.50 to $49.

Spelter.—There has been no change in spelter prices during the week, and October and November shipments are held at 5.58½c to 5.60c, in carload lots, deliverted Pittsburg.

Muck Bar.—One large producer of muck iron is not quoting on account of the very low prices prevailing. The market is very quiet and quotations continue nominally at $27.50 to $28.50.

Skelp.—The skelp market continues quiet and there is little buying. Grooved and sheared iron skelp are held at 1.60c to 1.65c, Pittsburg, and steel skelp is held at 1.55c to 1.60c.

Rails and Track Material.—While no statement has been issued assigning a reason for shutting down the Ohio plant of the Carnegie Steel Co., it is asserted that some of the railroads are holding back specifications temporarily. We make the following quotations: Standard sections, 50 pounds and over, in lots of 500 tons and over, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 8 pounds, in carload lots, $39; less than carload lots, $40; 12 pounds, $32 to $32.50; 16 and 20 pounds, $30.50 to $31; 25 to 40 pounds, $30. Track material: Spikes, 2.05c to 2.10c; track bolts, square nuts, 2.50c; hexagon nuts, 2.65c; fish plates, 1.60c on orders accompanying large rail contracts, otherwise 2c to 2.10c is asked.

Bars.—While the number of orders for steel bars is larger than for some time, the tonnage continues limited and buyers are continuing to pursue the policy of buying for immediate delivery only. There is little demand for iron bars and they are quoted on a basis of 1.40c to 1.45c, Pittsburg. We make the following quotations: Bessemer steel bars, 1.60c; open-hearth, 1.70c; plow beams and cultivator beams, 1.60c, net; channels, angles, zees and tees, Bessemer, under 3 inches, 1.70c; over 3 inches, 1.80c; common bar iron, 1.40c to 1.45c, Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds of a size and not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance. Hoops and bands are quoted at 1.90c, full extras, in 250-ton lots and over, and 2c in less than 250-ton lots.

Plates.—Both plates of the Pressed Steel Car Co. continue idle and the plate mills continue to suffer on account of this large consumptive demand being cut off. We make the following quotations: Tank plates, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c, and it ranges in price to 3c. Plates more than 100 inches, 5c extra 100 pounds. Plate 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5c extra a hundred pounds for less than carload lots. Terms, net cash, in 30 days.

Structural Material.—Small orders for structural material continue to be placed, but no contracts have been placed during the week for great structures. Quotations remain unchanged as follows: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles, from 3 to 16 inches, 1.60c; universal mill plates, 1.60c.

Sheets.—The amount of new business that is being received by the sheet mills is fair, and prevailing quotations are not being shaded. Black sheets in 500-bundle lots and over are held as follows: No. 28, 2.65c to 2.70c; No. 27, 2.55c to 2.60c; No. 26, 2.45c to 2.50c; Nos. 22 and 24, 2.35c to 2.40c; Nos. 18 and 20, 2.25c to 2.30c; Nos. 14 and 16, 2.15c to 2.20c; Nos. 10 and 12, 2.05c to 2.10c. Galvanized: No. 16, 2.55c to 2.60c; No. 18-20, 2.80c to 2.85c; No. 22-24, 3.05c to 3.10c; No. 25-26, 3.30c to 3.35c; No. 27, 3.55c to 3.60c; No. 28, 3.80c to 3.85c; No. 29, 4.30c to 4.35c; No. 30, 4.45c to 4.50c.

Pipes and Tubes.—Consumption of pipes and tubes continues unparalleled and the country's production this year will far surpass that of last year. Current demand is excellent and the National Tube Co. is having no trouble in maintaining present quotations. We quote as follows in carload lots to consumers, f. o. b. Pittsburg, plus freight according to Tube Rate Book to destination:

MERCHANT PIPE.

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Wrought Iron Pipe. Black. Percent.	Wrought Iron Pipe. Galv. Percent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
¾ to 6 inch	75	65	72	62
7 to 12 inch	69	59	66	56
Plugged and Reamed				
1 to 4 inch	73	63	70	60
Extra Strong Plain End				
⅛ to 8 inch	67	57	63	53
Threads only	66	56	62	52
Threads and Couplings	65	55	61	51
Double Extra Strong Plain End				
¼ to 8 inch	59	49	55	45
Threads only	58	48	54	44
Threads and Couplings	57	47	53	43

NOTE.—Orders for less than carload will be charged at 12½ percent advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 percent net for 6 feet and longer, and 15 percent net for 3 to 6 feet.

BOILER TUBES.

Steel.

	Percent.
1 to 1½ inches	45
2¼ to 5 inches	62½
1¾ to 2¼ and 6 to 13 inches	52½

Iron.

	Percent.
1 to 1½ inches	36½
2¼ to 5 inches	45½
1¾ to 2¼ and 6 to 13 inches	35½

CASING.

	S. and S. Percent.
2 to 3 inches	58
3¼ to 4 inches	60
4¼ to 12½ inches	63

Wire and Wire Nails.—A few departments of the Rankin plant of the American Steel & Wire Co. were shut down this week for repairs, but the idleness will not be extended. Demand continues good and the fall trade of the jobbers is much heavier than expected. We make the following quotations: Wire nails, carload lots, to jobbers, f. o. b. cars, Pittsburg, $2; plain wire, carload lots, $1.90; barb wire, carload lots, $2.30; staples, carload lots, $2.20. Galvanizing 30 cents extra. Carload lots to retailers are held at 5 cents advance in all lines, and on less than carload lots a further advance of 10 cents is charged. Steel cut nails are quoted as follows: Carload lots, $2.15, and less than carload lots, $2.20, f. o. b. Pittsburg, plus freight to point of destination. Iron cut nails are $2.25 in carload lots and $2.30 in less than carload lots. Terms, 60 days, less 2 percent off in 10 days.

Merchant Steel.—There is practically no change in conditions, the number of orders that are being received being much larger than during corresponding weeks in September, but the tonnage continues small. We quote: Turned cold rolled and ground shafting, 47 off in carload lots and 42 percent off in less than carload lots. Tire steel, 2.15c to 2.25c; spring steel, 2.25c to 2.35c; toe calk, 2.30c to 2.40c. Tool steel is quoted 7 cents and upwards, according to the grade.

Old Material.—The amount of melting stock piled at all of the steel mills in this district is very large and until this is consumed there will be no active market for this material. Iron mills are not buying to any extent, and transactions are limited almost entirely to small transactions in cast scrap for foundries.

Coke.—At a meeting of independent coke operators held at Uniontown, Pa., last week a committee of three was appointed for the purpose of securing the co-operation of all the independent coke producers to regulate prices. The committee consists of Harry Whyel, G. S. Hara and E. D. Fulton. Several large producers in the region have already refused to enter into the agreement and it is doubtful if the organization can be effected. The largest producers assert that the present condition can best be met by putting out ovens and they are doing this with a strong hand. Nearly 5,500 ovens are now idle in the Connellsville region and for the week ending Saturday, Oct. 10, the production of the upper region amounted to 198,419 tons, while that of the lower region was estimated at 51,000 tons. This week one contract calling for the shipment of 400 tons of coke daily to Buffalo, N. Y., was placed, being the largest order for some time. Furnace coke is quoted at $1.75 to $1.85, while Connellsville foundry coke is held at $2.50 to $2.75.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1115 MONADNOCK BLOCK, Oct. 20.

With the breaking up of the Southern Pig Iron Association, which occurred last week, prices of pig iron have reached a lower level and in some directions a movement to cover has set in. The buying is not as yet of very large proportions, but it is marked enough to show a change from recent weeks. The news that the association had dissolved was not unexpected, for since the discovery that certain selling agents had been taking business at prices below the official basis, there has been an increasing restlessness and a desire to break away from the agreement. The Alabama Consolidated Coal & Iron Co., it is said, was the first to withdraw, and this firm was closely followed by the Sloss-Sheffield Steel & Iron Co. The differential of $1 a ton in favor of Eastern foundrymen was immediately abolished and iron is now being offered to melters in all parts of the country by former members of the association on the basis of $10.75 Birmingham for No. 2 foundry. Other Southern furnaces, however, are quoting prices 50 cents and more below this basis.

In finished lines, rails continue to be in best demand. Sales are not heavy, though inquiries pending approximate 50,000 tons. Bar iron has reached a lower basis during the week, and purchases can now be made at 1.45c Chicago. There is only a moderate demand and mills report a falling off in specifications. Sheet is weak though prices are unchanged. Specifications for plates have fallen off again, and notwithstanding the large business booked, producers are only able to keep mills filled for a few days ahead. Tubular goods are in fair demand, especially the larger sizes. Light pipe is weak on account of the quietness in the building trades. Cast iron pipe has been reduced $1 a ton as a result of the drop in pig iron. New business in this material is limited in its proportions. Billets are moving in small lots and prices are being shaded from $1 to $1.50 a ton by independent mills. The rod and billet mill of the Illinois Steel Co. at Joliet is still idle, and will continue so for another week or ten days. The company has also put out of blast three of its furnaces —two at South Chicago and one at Bridgeport, all of which are being relined. This brings the total of idle furnaces in this district to five and includes the Mayville and Zenith, both of which went out of blast some weeks ago. Sheets are irregular with falling prices. Specifications for merchant steel come in freely from implement and carriage manufacturers, and it is noteworthy that the agricultural trade in wire products is also of good proportions. The scrap market is without interest and prices have fallen off over $1 a ton within the past two weeks. Coke is in good demand, though shipments are seriously delayed by the car scarcity at Connellsville.

Pig Iron.—Buyers and sellers of pig iron appear to have at last got to a basis where they can transact business. This market has not seen such activity as that of the past week since the famine prices of a year ago. The buying movement has been brought about largely by the abolition of the Southern agreement and the establishment of one price to all consumers, East or West. No. 2 foundry is now being quoted freely by the former members of the association at $10.75 Birmingham, and on a desirable order this price could be shaded 50 cents without difficulty. The anxiety shown by melters to cover for their requirements following the announcement of the cut in prices is indicative of the low stocks most of them have been carrying One consumer who bought 2,000 tons of No. 2 offered to make a contract for 4,000 tons additional at $10.75 Birmingham, the iron to be delivered in the year commencing with July next. The proposition was refused, however, most of the furnaces pursuing the policy of declining to sell for any period extending beyond July, 1904. All grades of iron are in demand, and a number of large individual contracts have been closed. The magnitude of the buying movement may be estimated from the statement of one producer that it closed contracts in two days of last week aggregating 10,000 tons. The reduction in Southern irons has compelled Northern producers to lower their prices, and we have revised our quotations accordingly. We quote as follows:

Lake Superior Charcoal	$17 50 to 18 00
Northern Coke Foundry No. 1	15 50 to 16 00
Northern Coke Foundry No. 2	15 00 to 15 50
Northern Coke Foundry No. 3	14 00 to 15 00
Northern Scotch Foundry No. 1	15 50 to 16 00
Ohio Strong Softeners No. 1	17 30 to 17 80
Ohio Strong Softeners No. 2	16 80 to 17 30
Southern Coke Foundry No. 1	14 85 to 15 10
Southern Coke Foundry No. 2	14 35 to 14 60
Southern Coke Foundry No. 3	13 85 to 14 10
Southern Coke Foundry No. 4	13 35 to 13 60
Southern Gray Forge	13 10 to 13 35
Southern Mottled	12 85 to 13 10
Southern Silveries (4% to 6% Silicon)	16 85 to 17 50
Jackson Co. Silveries (6% to 8% Silicon)	17 50 to 18 50
Jackson Co. Silveries (8% to 10% Silicon)	19 00 to 19 50
Alabama and Georgia Car Wheel	21 85 to 22 85
Malleable Bessemer	16 00 to 16 50
Basic Iron	15 10 to 15 60

Billets.—There has been little demand during the week under review, sales being limited to a few carload lots of forging billets. Reports are frequent that the independent producers are shading prices. We quote mill shipments, carload lots, Chicago delivery: Bessemer billets, $27; open-hearth, $28. Forging billets in small lots, $31 to $32. From store, the latter are quoted $1.60 to $1.70 per 100 pounds.

Bars.—The market shows no marked improvement in the demand for either steel or iron bars. New business is light and specifications are running behind contract requirements. Iron bars have sold during the week on the basis of 1.45c, though on small lots 1.50c is generally asked. Store trade is fairly brisk. We quote mill shipments, carload lots, Chicago delivery, iron, 1.45c to 1.50c; Bessemer steel, 1.76½c; angles less than 3x3, 1.86½c base; hoops in lots of 250 tons and greater, 2.06½c; less than this amount, 2.16½c. Quotations from warehouse stocks, iron, 1.70c to 1.80c; steel, 1.90c to 2c; hoops, 2.30c to 2.40c; angles, 2.10c rates.

Sheets.—There is little change to report in the situation. Demand is fairly brisk, but the low prices being made make a considerate portion of the business unprofitable to some mills, and these are practically out of the market. We quote black sheets, mill shipments, Chicago delivery, No. 27, 2.71½c to 2.81½c; No. 28, 2.81½c to 2.91½c. Prices on galvanized range from 75, 10 and 2½ percent discount to 75, 10 and 5 percent on mill shipments. On lots from store, we quote No. 27 black, 2.76½c to 2.86½c; No. 28, 2.86½c to 2.96½c. Galvanized, 75 to 75 and 5 percent discount.

Plates.—Specifications have fallen off and the local producer reports it is able to keep its mill filled only for two days ahead. New business is very light and limited largely to sales from warehouse stocks. Prices are firm without change. We quote mill shipments, Chicago delivery: Tank steel, ¼ inch and heavier, 1.75c; flange steel, 1.85c. On lots from jobbers' stocks, we quote: Tank steel, ¼ inch and heavier, 2c to 2.10c; 3-16, 2.10c to 2.15c; No. 8, 2.15c to 2.20c; No. 10, 2.30c to 2.35c; flange steel, 2.25c to 2.40c, all f. o. b. warehouse.

Structural Steel.—New business continues small in volume, and though several large structures are under consideration, it will be some time before figures will even be asked. Railroads are taking only a small quantity on their contracts. We quote mill shipments, Chicago delivery, as follows: Beams and channels, 16 inches and under, 1.75c; 18 inches and over, 1.85c; universal plates, 1.75c; angles 3x3 and larger, 1.75c; tees, 3x3 and larger, 1.80c; zees, 1.75c. Lots from store, for which there has been a moderate demand, are quoted 2.10c to 2.25c per 100 pounds, rates, cut to length.

Merchant Steel.—Demand continues to keep up to past proportions and mills are getting a plentiful supply of specifications. We quote mill shipments, Chicago delivery, as follows: Spring steel, 2.65c to 2.75c; sleigh shoe, 1.95c; flat sizes, concave and convex, 2.25c; cutter shoe, 2.50c to 2.60; machinery steel, 2.15c to 2.25c base; plow steel, 2.50c and upwards, according to quality; toe calk, 2.35c to 2.45c; out of stock, 3c to 3.10c; ordinary tool steel, 6c to 7c; special, 13c and upwards; less than carload lots, 5 and 10 percent higher; cold rolled shafting, carload lots, 47 percent off; less than carload lots, 42 percent off.

Merchant Pipe.—There is an active demand for the larger sizes from the oil fields, but owing to the quietness in the building trades, light sizes of pipe are weak. Mills are sold some distance ahead on the former product, but can give deliveries on the latter within one week. Prices are without change, and we quote to consumers on mill deliveries, carload lots, random lengths, f. o. b. Chicago, as follows:

	Steel Pipe.		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ to ⅜ inch inclusive	66.35	56.35	63.35	53.35
½ inch	68.35	58.35	65.35	55.35
¾ to 6 inches	73.35	63.35	70.35	60.35
7 to 12 inches inclusive	67.35	57.35	64.35	54.35

Less than carload lots, 12½ percent advance over above prices.

Boiler Tubes.—The volume of business continues to be relatively the same. Jobbers have been placing some good sized contracts recently. We have revised our prices and quote carload lots, Chicago delivery, as follows:

	L. W. Steel. Percent.	C. C. Iron Percent.
1 to 1½ in.	40.85	37.35
1¾ to 2½ in.	53.85	36.35
2¾ to 5 in.	59.85	46.35
6 to 13 in.	53.85	36.85

For lots direct from warehouse stock:

	L. W. Steel. Percent.	C. C. Iron. Percent.
1 to 1½ in.	40	35
1¾ to 2½ in.	50	32½
2¾ to 5 in.	57½	42½
6 to 13 in.	50	32½

Cast Iron Pipe.—In small lots, there is a good demand, the bulk of the business coming from gas and water companies in Southwestern States. The leading producer reports that it is seriously handicapped at all its plants in making shipments, by a scarcity of cars. Prices have been cut $1 a ton as a result of the weakness in pig iron. We quote carload lots, f. o. b. Chicago, 4-inch pipe, $29; 6-inch and upwards, $28; gas pipe, $1 a ton higher.

Rails and Track Supplies.—Little of the business in heavy rails that was reported last week as pending—approximately 50,000 tons—has been closed. The inquiries include one for 20,000 tons from a construction company building an electric road in Omaha; another from an electric road in Memphis for 9,000 tons, and an inquiry from the Santa Fe Railway for 10,000 tons. Light rails are active. Track supplies are weak, demand having fallen off. We quote standard sections, 500 tons and over, $28; less than 500 tons to carload lots, $30; less than car lots, $32; second quality rails, $27; 25-pound rails, $31 to $32; 12-pound rails, $34 to $35, with regular differentials for intermediate sizes. Track supplies, mill shipments: Angle bars, 1.90c to 2c; spikes, first quality, 2c to 2.10c; (out of store, 2.25c to 2.35c rates, carload lots) second quality, 1.80c to 1.90c; track bolts 3½x¾, with square nuts, 2.75c to 2.85c per 100 pounds; with hexagon nuts, 2.90c to 3c, with usual differentials for other sizes.

Wire and Wire Nails.—The business of wire mills continues to be good, both the jobbing and manufacturing trade sending in orders and specifications freely. Proportionately speaking, however, orders are not as heavy or as numerous as they were some months ago, the approach of the dull season being largely responsible for this. Prices are firm without change. We quote prices to jobbers, Chicago delivery: Wire nails, carload lots, $2.20; less than carload lots, $2.30. Cut nails, steel, carload lots, $2.26½; less than carload lots, $2.36½. Plain wire, $2.10 carloads and $2.20 in small lots; galvanized, carloads, $2.40; smaller lots, $2.50. Barbed wire, carloads, $2.50; less than carloads, $2.60; galvanized, carloads, $2.80; less than carloads, $2.90; staples, carloads, $2.30; smaller lots, $2.40; galvanized, carloads, $2.60; small lots, $2.70. Bale ties, 82½ and 5 percent discount f. o. b. Waukegan on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliet or DeKalb, with actual freight allowed not exceeding 50 cents per 100 pounds.

Coke.—Buying continues good, though the car shortage at Connellsville is becoming a serious factor in the situation. Spot fuel is scarce and is bringing from 25 to 50 cents a ton higher than contract coke. We quote standard 72-hour Connellsville, $2.75 to $3.25 at the ovens; 48-hour Connellsville, $2.15 at the ovens. Virginia and West Virginia grades, $5.15 to $5.40 Chicago.

Old Material.—There is very little demand and owing to the large offerings by railroads prices have fallen from 50 cents to $1 a ton. Few sales are reported. We quote dealers' selling prices, gross tons, as follows:

Old iron rails	$16 00 to 16 50
Old steel rails (mixed lengths)	12 00 to 12 50
Old steel rails (long lengths)	15 00 to 15 50
Relaying rails	23 00 to 24 00
Old wheels	16 00 to 16 50
Heavy melting steel	12 00 to 12 50
Mixed country steel	10 00 to 10 50

The following are selling prices for net tons:

No. 1 R. R. wrought	$13 00 to 13 50
No. 2 R. R. wrought	12 00 to 12 50
Shafting	13 00 to 13 50
Dealers' forge, No. 1	11 50 to 12 00
No. 1 busheling and wrought pipe	10 00 to 10 50
No. 1 cast	12 50 to 13 00
Heavy cast (300 pounds and over)	10 00 to 10 50
Agricultural malleable	11 50 to 12 00
Iron axles	16 50 to 17 00
Steel axles	14 00 to 14 50
No. 1 boilers, cut	10 00 to 10 50
Cast borings	$ 4 50 to 5 00
Mixed borings, etc.	4 50 to 5 00
Wrought turnings	9 50 to 10 00

Machine shop turnings	9 50 to 10 00
Iron axle turnings	10 00 to 10 50
Steel axle turnings	9 50 to 10 00
Stove plate and light cast scrap	10 00 to 10 50
Old iron splice bars	14 25 to 15 00

C. E. Louis, 618 The Rookery, Chicago, has been appointed exclusive agent in Chicago territory for the Roane Iron Co., Chattanooga, Tenn., and the Citico Furnace Co., of the same city; also agent for the Pulaski Iron Co., Philadelphia, in the sale of the iron produced at the furnace in Pulaski, Va.

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, Oct. 20.

The week has been one of extreme quiet. The dissolution of the Southern association is regarded as one more influence in the making of lower prices, and Northern furnaces will be compelled to reduce prices to meet the Southern competition, but it is confidently expected that the curtailment of product, which has been inaugurated with every prospect of being faithfully carried out as agreed, will soon have a steadying influence. A discouraging feature is the dullness of the foundry business. Few foundries are running up to their capacity and some are in operation only three days of the week.

Iron Ore.—Wild vessels are having much difficulty in getting cargoes and it is rather surprising that some have not been compelled to go out of commission. The curtailment of mining operations has not reduced shipments as much as might be expected, as considerable ore is being taken from stock piles. As the end of the season of navigation approaches, some furnaces discover that they will need a limited amount of ore, but they usually find other furnaces anxious to sell, believing that ore prices will be lower next year. The Pittsburg Steamship Co. will close the season rather later than has been expected, as it does not anticipate that shipments will stop prior to Nov. 15. Freights continue unchanged.

Pig Iron.—The breaking up of the Southern association by the withdrawal of the Sloss-Sheffield Steel & Iron Co. and the Alabama Consolidated Coal & Iron Co. was not a great surprise, as recent indications that at least one association interest had made a price below the agreed quotations had prepared the trade for exactly what happened. The usual quotation is now $14.10 Cleveland for No. 2, the freight rate being $3.85 from Birmingham and $3.60 from Sheffield. Some sales have been made at this price, but buyers are not at all eager to do business except for immediate requirements. Northern furnaces are slow in reducing prices to meet Southern competition, but rumors of sales at $14.50 Cleveland are heard. Some contracts have recently been made for future delivery at prices prevailing at time of delivery. Persistent efforts of buyers who purchased at higher prices to obtain release from contracts or concessions are features of the present market. We quote as follows for Cleveland delivery, save on gray forge, which is at Valley furnace:

Bessemer	$16 00 to 16 25
No. 1 Strong Foundry	15 00 to 15 50
No. 2 Strong Foundry	14 50 to 15 00
No. 3 Foundry	14 25 to 14 50
Scotch No. 1	15 00 to 15 50
Scotch No. 2	14 50 to 15 00
Gray Forge, Valley furnace	13 25 to 13 50
Lake Superior charcoal	17 50 to 18 00

Finished Material.—Bar iron continues weak and for a large order a buyer would have no trouble in getting a quotation of 1.40c Youngstown, while small orders are taken at 1.45c. Steel is quiet and firm at 1.60c for Bessemer and 1.70c for open-hearth, Pittsburg. Structural material is very dull, as nearly all contracting firms have in stock more than enough to meet their requirements for months to come. The volume of business in sheets is not large. Official quotations as given for publication have ceased to be a guide to real prices, which are shaded as required to meet competition. We revise our quotations as follows: Mill sales of black sheets, No. 27, 2.60c to 2.65c; No. 26, 2.55c to 2.50c; No. 24, 2.45c to 2.55c. The following are prices out of stock: No. 10, 2.15c to 2.30c; No. 12, 2.25c to 2.40c; No. 27, 2.85c to 2.95c; No. 28, 2.95c to 3.05c. Galvanized sheets are sold at 75, 10 and 5 off for large lots, desirable specifications, and 75, 10 and 2½ off for smaller lots.

Old Material.—Business is extremely dull and prices are still tending downward. We quote the following, gross tons, Cleveland:

Old iron rails	$18 00 to 19 00
Old steel rails (over 6 feet)	16 00 to 17 00
Old steel rails (6 feet and under)	15 00 to 16 00
Old car wheels	17 00 to 18 00
Steel boiler plates	13 00 to 13 00
Malleable iron (railroad)	14 00 to 14 25
Malleable iron (agricultural)	12 00 to 13 00
Heavy steel	13 00 to 13 50

We quote the following net tons:

No. 1 R. R. wrought	$14 00 to 15 00
Mill scrap	13.00 to 13.50
No. 1 machine cast scrap	12 00 to 12 50
Iron axles	19 00 to 20 00
Axle turnings	12 00 to 13 00
Wrought turnings (free from cast)	10 00 to 10 50
Uncut wrought iron boilers	9 00 to 10 00
Grate bars	10 00 to 11 00
Pipes and flues (clean)	12 00 to 13 00
Tank iron	12 00 to 13 00
Hoop and band iron	9 00 to 10 00
Sheet iron	7 00 to 8 00
Wrought drillings	10 00 to 10 50
Stove plate	9 50 to 10 50
Steel axles	20 00 to 21 00
Cast borings	6 00 to 7 00

CINCINNATI.

Oct. 20.

The important development of the week has been the breaking up of the association of Southern furnaces. Lower prices for pig iron have naturally been made and there is now no price agreement as a modifying influence. The coke market is quiet and foundry coke is selling at $2.75 to $2.85 f. o. b. ovens. The demand is mainly for moderate quantities and there is but little buying for future wants.

Pig Iron.—The market has made a further decline during the week and $10.25 Birmingham for No. 2 foundry is an open quotation with a $10 price rather freely talked of, but not yet certainly established. The decline has not greatly stimulated buying in this market. One large order that was to have been placed this week has been deferred, as the buyer decided to wait now instead of anticipating his wants. An order for 3,000 tons of No. 3 and No. 4 foundry at a Northern Ohio point was placed on the basis of $10.25 Birmingham for No. 2. This was the only large transaction given out locally. The demand is rather light and business is still of the small-lot character that has been the rule in the recent past. In southern Ohio (Ironton district) No. 2 foundry is quoted at $14.50 at furnace, although some of the furnaces in this district have declined to go below $14.75 and are maintaining the latter price. The general opinion in the trade is that the breaking up of the association in the South means a "survival of the fittest" and that the market will now find its level in the regular course of supply and demand. It is not clear in the trade as to whether there will be carried out any plan for the curtailment of output by the Southern furnaces. It is claimed by some that the original plan of the association to cut down production 25 percent in the last quarter will be carried out, but it is considered, on the other hand, that all association arrangements are now ineffective, and that no reduction of output by agreement so far as the Southern furnaces are concerned is now in force. However, the committee of the association appointed to take this question up has not abandoned its work on the proposition. Present prices for Southern iron put that product in sharp competing situation with Northern furnaces and the trade here is confident now of being able to place a good share of the tonnage needed in Western territory, including Pittsburg district. The following are the prices current, f. o. b. Cincinnati:

Southern Foundry No. 1	$13 50 to 13 75
Southern Foundry No. 2	13 00 to 13 25
Southern Foundry No. 3	12 50 to 12 75
Southern Foundry No. 4	12 00 to 12 25
Southern Foundry No. 1 soft	13 50 to 13 75
Southern Foundry No. 2 soft	13 00 to 13 25

Gray forge	11 75 to 12 00
Northern Foundry No. 1	16 15 to 16 40
Northern Foundry No. 2	15 65 to 15 90
Northern Silvery (8% silicon)	18 65 to 19 15
Southern car wheel iron	20 50 to 21 00

Finished Material.—The market is dull and an easy tone prevails in all lines. There is no quotable change in prices but concessions are obtainable where prices are contested. The bar iron situation is further weakened, with no established quotation being observed. On carload lots quotations around 1.50c f. o. b. Cincinnati, are made. Steel bars remian at 1.73c base, half extras, with the retail price 1.90c for iron and steel out of store. Galvanized sheets are being quoted at 75 and 10 percent off. We quote black sheets No. 27 at 2.78c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 3.05c; No. 27, 2.95c; No. 16, 2.55c; No. 14, 2.45c; No. 12, 2.40c; No. 10, 2.30c. Tank plates are firm and sell out of store at 2.05c for ¼-inch and 2.15c for 3-16-inch. Beams and channels are quoted at 2c from stock, and angles at 2c for base sizes. In merchant pipe there is still a fairly good demand reported and prices are sustained. The following quotations represent prices for carload lots:

MERCHANT PIPE.

(Basing Discounts.)

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed. Wrought Iron Pipe. Black. Percent.	Guaranteed. Wrought Iron Pipe. Galv. Percent.
⅛, ¼, ⅜ inch	66.7	56.7	63.7	53.7
½ inch	68.7	58.7	65.7	55.7
¾ to 6 inch, inclusive	73.7	63.7	70.7	60.7
7 to 12-inch, inclusive	67.7	57.7	64.7	54.7

BOILER TUBES.

	Steel Percent.	Iron Percent.
1 to 1½ inch	41.2	37.7
1¾ to 2½ inch	54.2	36.7
2¾ to 5 inch	59.7	46.7
6 to 13 inch	54.2	36.7

Old Material.—The market remains dull and easy and quotations are reduced on some descriptions. We quote:

Old No. 1 railroad wrought, net tons	$12 50 to 13 00
Cast machine and foundry, net tons	11 00 to 11 50
Old iron rails, gross tons	18 50 to 19 50
Old steel rails, gross tons	16 00 to 17 00
Old short lengths, gross tons	13 50 to 14 50
Old iron axles, net tons	19 00 to 20 00
Stove plate, net tons	9 00 to 9 50
Wrought turnings, net tons	11 00 to 11 50
Cast borings, net tons	6 00 to 6 50

PHILADELPHIA.

Oct. 20.

The agreement to curtail production of pig iron is not being carried out with entire good faith, if numerous reports are to be believed, and the effect on the market is not good. Buyers are more inclined to keep out of the market and sales are small. In finished material, conditions are not so unfavorable as in pig iron. The situation is complicated and there is danger of still lower prices.

Pig Iron.—The market is on the verge of demoralization, especially in steel making grades, which are being piled rapidly. Consumption of foundry irons has not been reduced to any large extent. Good No. 2 X foundry is scarce and commands $15.50 to $16 delivered. We quote: No. 1 X foundry, $16.50 to $17; No. 2 X foundry, $15 to $16; No. 2 plain, $15.50 to $14.75; standard gray forge, $14.50 to $14.75; ordinary gray forge, $14 to $14.25; basic, $14 to $14.50.

Steel.—There is a small hand to mouth trade at about $27 for small lots, ordinary open-hearth. Large lots could be placed at half a dollar less.

Old Material.—There is little demand, with prices tending downward. We quote: Old steel rails, $14.25 to $14.50; heavy steel, $14 to $14.25; steel axles, $16 to $17; old iron rails, $19 to $20; car wheels, $17 to $18; machinery scrap, $14 to $14.50; cast borings, $7.25 to $7.75; stove plate, $11 to $11.50.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, NO. 150 NASSAU ST., Oct. 20.

Pig Iron.—All of the developments in the local pig iron market during the past week were of an adverse character. Since the Southern pig iron agreement has been abrogated all sorts of prices are heard for Southern No. 2 foundry at Birmingham, ranging from $10 to $10.75. In Northern irons the same irregularity in prices is noted. It is understood that Northern No. 2 X foundry can be had for $15.50 delivered, while from Philadelphia comes the report that on large lots $15 delivered can be done. Everything is in favor of buyers. Those who have been steady buyers for years of particular brands are now placing their orders with those from whom they can get the best terms. Consumers are still talking lower prices, and are buying very cautiously. New York prices are as follows: Northern No. 1 X, $16 to $16.50; No. 2 X, $15.25 to $15.75; No. 2 plain, $14.75 to $15; Southern No. 1 foundry, $14.50 to $15; No. 2 foundry, $13.75 to $14.25; No. 3 foundry, $13.50 to $14; No. 4 foundry, $12.75 to $13.25.

Billets.—Trading is on a very light scale, with Bessemer obtainable at $26. Buyers have intimated that lower can be done.

Finished Iron and Steel.—The structural mtaerial market during the week has been verty dull. The American Bridge Co. closed contracts for 4,500 tons, divided about equally between the Baltimore & Ohio, Rock Island, and Atchison railroads. As previously noted, the company has contracts aggregating 28,000 practically closed, but the parties represented have not signed the necessary papers. The company is counting on their doing so before the month is over, but is prepared to be disappointed, owing to the feeling of unrest that has developed. The Blackwell's Island matter is still in abeyance. The situation in iron bars shows no improvement, and the buyer has still the upper hand. Only a slight business is doing in plates, and good propositions call forth concessions. Sheets are quiet, with not enough business going to affect prices one way or the other. New York prices are as follows: Beams and channels, 15 inches and under, 1.75c to 1.90c; angles, 3 to 6 inches, 1.75c to 1.90c; zees, 1.75c to 1.90c; bulb angles, 2.05c to 2.35c; deck beams, 2.05c to 2.25c; sheared steel plates, tank, 1.79c to 1.86c; flange, 1.90c to 2c; firebox, 2.10c to 2.20c; refined iron bars, 1.45c to 1.50c; soft steel bars, 1.70c to 1.75c; steel sheets, in carloads, New York, No. 28, 2.80c to 2.90c; galvanized, 75 and 10 to 75 and 5 off.

BIRMINGHAM, ALA.

Oct. 20.

Interest in the pig iron trade of this district the past week centered in what seems to be the complete dissolution of the pool or "gentlemen's argeement" termed the Southern Pig Iron Association, organized about July 1, 1901. From the best information obtainable the companies belonging to the association were the Tennessee Coal, Iron & Railroad Co., Republic Iron & Steel Co., Sloss-Sheffield Steel & Iron Co., Lacey-Buek Iron Co., and Alabama Consolidated Coal & Iron Co., of Birmingham, the Roane Iron Co., of Rockwood, Citico Furnace Co., of Chattanooga, Chattanooga Furnace Co., Chattanooga,, and the Virginia Coal & Iron Co. It is understood the Chattanooga Furnace Co. withdrew from the association about July 1, 1903. The assocation first attracted attention by its attempt in the year 1902 to hold prices of iron to a level of about $12 Birmingham for No. 2 foundry. To accomplish this end and to prevent a runaway market, it is said some of the members sold practically their entire output for 1902 at or below that figure. Yet the market rapidly and steadily advanced to $25 Birmingham, which was the highest point reached for spot iron. When there was a recession in prices the association made strong efforts to prevent a panicky market, and for some time had a certain degree of success in this attempt, although the independent furnaces were the only concerns to reap any material benefit from the association's action, such outside furnaces adopting the policy all the while of shading schedule prices just enough to take the business offered.

Rumor has for some time had it that there was much lack of harmony inside the association, some members insisting that all restrictions as to prices should be withdrawn, and in some cases it is alleged agreements were not carried out to the letter. Failing to agree as to the adoption of a policy that would be satisfactory to all members, it is understood

that at least three companies have withdrawn, in the order named: Alabama Consolidated Coal & Iron Co., Sloss-Sheffield Steel & Iron Co., and Lacey-Buck Iron Co. This, of course, means that the association is a thing of the past and that there is now no such thing as "Southern schedule prices." At the time of the disruption schedule prices were $11.75 for No. 2 foundry to all points west of Pittsburg, and $10.75 to Eastern points. Immediately after the withdrawal of the members named, Eastern prices were made effective to all points and business was sought in all directions accordingly—and it is not believed that attractive counter-propositions were turned down, as it is generally known that Southern stocks of iron are much larger relatively than in other directions. One interest is reported as selling immediately 10,000 to 20,000 tons, all for prompt shipment, while others are understood to have made relatively as good sales. It is generally admitted that prices will be made to meet competition wherever encountered, though for the most part $10.50 Birmingham is understood to be the open quotation. We make the following quotations, f. o. b. Birmingham:

No. 1 Foundry	$11 00 to 11 25
No. 1 Soft	11 00 to 11 25
No. 2 Foundry	10 50 to 10 75
No. 2 Soft	10 50 to 10 75
No. 3 Foundry	10 00 to 10 25
No. 4 Foundry	9 75 to 10 00
Gray forge	9 50 to 9 75
Alabama carwheel iron, all grades	18 00

No iron has been exported up to this time, but there have been several inquiries. If a rate of $2.50 to Manchester can be secured, it is quite likely that a lot of iron could be secured at a price that would justify entering the foreign field. With the movement of cotton across the water, it is known that very favorable rates can be secured on iron within the next few weeks, as the tonnage would be greatly desired as ballast.

The reports of the Southern Iron Committee show that during the month of September over 137,000 tons of pig iron moved from Southern furnaces, notwithstanding the depressed condition of the market. The movement was rather light, however, for the first ten days in October, awaiting the new rates which became effective on the 10th inst., carrying a general reduction to all Northern, Eastern and Western points of 50 cents per ton. With still lower prices that now prevail, it is expected the October tonnage will show up fully as well or better than September.

It is reported that the Pittsburg & Southern Coal & Iron Co., organized early in the summer with capital of $300,000, will increase its capital stock with a view of acquiring additional lands near Boyles and erecting one or more furnaces. Several thousand acres of coal and ore lands are said to have been taken up, and the Southern representatives of the concern claim the backers of the project are in earnest.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, NO. 150 NASSAU ST., Oct. 20.

Pig Tin.—While prices are practically unchanged from those quoted in our last report, the weak undertone noted then still exists. The demand is of the most meager kind, and speculative interests are encouraged thereby to depress the market. In London the situation during the week was better, and prices are up nearly £2 by way of comparison with this time a week ago. Closing prices at the Metal Exchange today were as follows: Spot, 25½c to 25⅞c; October, 25⅜c to 25.60c; November, 24⅞c to 25⅜c. London closed today as follows: Spot, £115 7s 6d; futures, £116. Arrivals at Atlantic ports for the month to date aggregated 2,255 tons, with 2,485 tons afloat.

Copper.—The only feature of interest for the week was the ⅛c reduction in the "official" prices. Opinions differ as to whether or not the latter are being shaded in the open market, but if so it would seem to an extent hardly worth mentioning. All attempts to get buyers to purchase outside of what they need immediately, end in failure, consequently business is extremely dull. The London market has shown symptoms of strength during the week, and prices are higher. Closing prices at the Metal Exchange today follow: Lake, 13⅛c; electrolytic, 13c; casting, 12⅝c. London closed today as follows: Spot, £54 10s; futures, £54 5s. Exports for the month to date amount to 5,528 tons, against 7,470 tons for a similar period last year.

Lead.—Spot still commands 4.50c. St. Louis is unchanged at 4.30c. London is slightly higher at £11 1s 3d.

Spelter.—The scarcity of spot has become more acute, and sales are now being made at 6⅛c. November is 5.55c. St. Louis is weaker at 5.40c. London is slightly higher at £20 7s 6d.

Antimony.—Cookson's is 7¼c, Hallett's 6¼c, and outside brands 5¾c to 6c.

Quicksilver.—Is quoted at $47 per flask of 76½ pounds in lots of 100 flasks. London is £8 7s 6d.

Nickel.—Is selling at 40c to 47c for large lots down to a ton, and 50c and 60c for smaller quantities.

CHICAGO.

OFFICE OF *The Iron Trade Review*.
1115 MONADNOCK BLOCK, Oct 20.

Trading in the metal market has been quiet during the week. Buyers are not convinced that the bottom in prices has been reached and are waiting for the drop which they believe must come before covering for their season's requirements. In the meantime, sales are largely for small lots. We quote Lake copper, carload lots, 13c to 13¼c; casting, 12⅞c to 13c. Pig tin, carloads, 26¼c; lesser lots, 26¾c. Pig lead, 4.40c in 50 to 100-ton lots, and 4½c to 4¾c in small quantities. Spelter, 5.60c in carload lots, and 6c in small quantities; sheet zinc, 6¼c; antimony, 7½c to 8c, for both Cookson's and Hallett's

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The Earle Gear & Machine Co., of Philadelphia, announces that on Nov. 1 it will have in operation its new gear and machine works, equipped with new machine tools, at Oxford and Mascher Sts., Philadelphia. A specialty will be made of large gears, and the company will also manufacture and develop special machinery from its own or customers' designs. The members of the firm are: Edgar P. Earle, formerly with the Westinghouse Machine Co., Robert J. Snyder, formerly with the Morgan Engineering Co., and Frank D. Hamlin, formerly with the Fawcus Machine Co. The company is represented by R. J. Snyder at 1318 Land Title Bldg., Philadelphia.

The October meeting of the New England Foundrymen's Association at Boston, Oct. 14, was attended by 65 persons, unusual interest being taken in the inspection trip to the new foundry of the B. F. Sturtevant Co. at Hyde Park. The following firms were elected to membership: Pevey Bros., Lowell, Mass.; B. Nichols & Co., 59 Wall St., N. Y.; American & British Mfg. Co., Providence, R. I.; Howard & Bullough, American Machine Co., Ltd., Pawtucket, R. I.; Taunton Locomotive Works, Taunton, Mass.

A. L. Wetherald, one of the stockholders of the Zanesville Iron Co., Zanesville, O., has asked for a receiver and the court appointed the Guardian Trust & Deposit Co., with power to sell the works, collect the accounts and terminate the business. The failure is attributed to the general condition of the iron market. The plant was built in 1848, and its product consisted of iron and steel bars, bands, and shapes, the annual capacity being 45,000 gross tons.

While in Lorain last week the officers of the United States Steel Corporation inspected the plants of the corporation in that city, and President Corey stated that the tube mills will be completed as rapidly as possible. President Schiller, of the National Tube Co., stated that 4,000 to 5,000 employes would be added to the pay roll by the erection of the new mills within a year and a half.

Improvements amounting to between $5,000,000 and $8,000,000 on the Pennsylvania Railroad have been stopped. It is the intention to stop all work that cannot be completed before the winter sets in. This order applies to the main line between Altoona and Pennsylvania.

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OCTOBER 22, 1903

THE PROBLEM OF STEEL WORKS EXTENSIONS.

There is ample evidence in current events that the building and operation of steel plants has not been reduced to an exact science. All the projects which have been on foot for the building of absolutely new plants have been attended with troubles of one sort or another; in one case the cost proves to be much greater than was originally estimated, in another the erection requires a great deal more time than was figured upon, in another the plant when completed does not work right. For instances of this principle it is not necessary to draw upon such extreme cases as one or two across the international boundary, where the multiplicity of stock ownership gave the ambitious promoter entirely too free a hand. In our country we have had no less than four concrete instances, the more striking in that none of them are strictly new enterprises. In none of the four are the plants entirely completed, or the funds entirely provided. In one case, after the funds originally provided proved entirely inadequate and a large addition was made, the company has very little productive capacity actually available, and the additional amount of money required is still largely problematical. In another case, purely an extension of an old and established business into somewhat new lines, what appeared to be ample additional capital has proved entirely inadequate; in another an addition of some 50 percent to the new capital originally provided is only being eked out by an entire stoppage of dividends; in another the situation is tided over by short term loans, and probably by the suspension of dividends. In all cases the work of erection has been much slower than expected, and the difficulty of getting materials and men, experienced last year, can no longer be blamed.

In one instance, striking because of its rareness, a company entered into a large additional line of iron and steel manufacture, and did so without raising new capital by either stock or bond issues, and maintained its prior rate of dividend payments. Its method was most unscientific, but intensely practical. It purchased some second-hand equipment for a mere song and set it up with a little new cheap machinery, and started right in to manufacture and make profits in the new department. Hardly was it running until it was announced that a part of the equipment would be supplanted by new thoroughly modern machinery. This new machinery was all made, and the plant kept running during whatever delays there were. Then it was rapidly set up. Soon an extension was announced, and this was tacked on when it was ready. Then it was planned to supplant the balance of the original equipment, and when everything was ready, the change was rapidly made. The result is that the company has an entirely new department, the actual cost and duplicate value running well into seven figures, which has been paid for purely out of surplus earnings, and without disappointment to the stockholders at any time. During its growth the plant has made money and it can well stand comparison with any of its competitors.

Nothing is clearer than that a natural growth is the proper order of things in the iron and steel industry. This is shown as well by the troubles and disappointments of those who have attempted new erection on a large scale, as by the history of the now successful iron and steel plants. They are in general the result of a steady growth, addition after addition being made, either by the occupying of additional ground, or by the tearing out of plant already built. The most successful works today were not laid out in accordance with that dream of the engineer "provision for extension." The wise iron and steel man does not plan ahead for extension. He does not know what the extension will be, or he puts it in at once. He does not mortgage his future to his knowledge of today. He builds most wisely who feels that he is constricted, not by his lack of capital, but by his lack of knowledge of what he may want. As his knowledge grows his original plant supplies the money with which to utilize it.

There was a period in the development of the iron and steel industry when the increase in the size of the unit brought a lower cost per ton of output. The larger the blast furnace the better; the more of them in one line the better; the larger the Bessemer converter the better; the more of them in one unit the better; the more tin mills under one roof the better; the larger the merchant bar mill the better; the larger the aggregation of blast furnaces, converters, open-hearth furnaces, blooming and billet mills and finishing mills, the better. As a general proposition, this period in the development of the industry has come to an end, but it is patent that in one or two present instances this fact has not been recognized.

In the erection of immense units of production the designer is of course striving after a minimizing of the management and superintendence cost per ton, which often results in a saving at the spigot and a wasting at the bung hole. The cost of one management for a unit of twenty open-hearth steel furnaces, for instance, is so little less per ton than the cost of two managements for two units of ten furnaces each, both being almost negligible, that it is better to have two

sets of brains to devise important economies than only one, besides having closer attention to details which in such large tonnages become of monumental importance. In railroading it does not pay to harness two locomotives to a double length freight train, although it would require but one conductor instead of two. In clockmaking accuracy of running is not obtained by doubling the size of the clock.

In the further development of the iron and steel industry it would appear that both concrete illustrations and abstract reasoning indicate that it is better for a plant to grow while productive than to achieve maturity at a bound, and better for it to show fineness of management in all the minor details than in a vast unwieldy aggregate.

HIGH SPEEDS AND HIGH EXPLOSIVES.

The lust for speed has been a very noticeable feature of late in the automobile world and the numerous accidents on the race track have not made sufficient impression to stop the foolhardy tendency. The influence of the spectacular in attracting attention to successful racing machines is conceded to be a valuable advertisement but little or nothing is gained beyond this. A cross-country trip is much more effective in trying the capabilities of a vehicle and the strains incident to highway travel will speedily develop weaknesses which would not come to light in a brief trip over a track made specially to favor the machine.

However, the feverishness of the racing epidemic has called for every possible speed-promoting influence, the increase in size of engines being naturally the most prominent of these agencies. This increase has grown to very large dimensions in the past few years even for the touring car requirements. The additional weight involved in bringing the horsepower of the car up to say 75—and this is not so extravagant an estimate as it may seem at first glance, for a 70-horsepower Mors took part in the recent races at Decauville, France—is of considerable magnitude and latterly attempts have been made in other directions to get greater energy out of the combination. The explosive force of the gases may be increased with due regard to the strength of the material enclosing them. This has been a favorite proposition with many inventors. Those who have followed the history of the subject will remember that a number of years ago a motor of small size but driven by gunpowder received some attention and was mentioned as a coming prime mover for motor cars. The matter was quietly allowed to drop out of public notice and for some years nothing has been heard of the invention. However, the identical idea would appear to be the basis of a present-day plan for increasing the explosive force of gasoline for a similar purpose. This involves the mixture of a small amount of picric acid with the oil. Picric acid is largely used in the preparation of some modern high explosives and is to be handled necessarily with care. The growing use of the compound has been made the subject of injuiry by the Home Department of the British Government and it appears that in England the acid is permitted to be stocked and sold in not greater quantities than 5-pound lots.

The chief inspector of explosives, Captain Thomson, says in reply to a correspondent, that his department has had some difficulty in coming to a decision in the matter but that for the present picric acid will not be regarded as an explosive when kept in small quantities for use with gasoline or petrol in internal combustion engines. The inspector points out a difficulty with the use of the acid which has stood in the way of other prime movers, the gunpowder engine, for example, and asserts that he does not anticipate that picric acid will come largely into use on account of its deleterious action on iron and steel.

The proportions of the mixture are quoted as one-tenth of an ounce of the acid to half a gallon of the gasoline and according to the *Ironmonger* this results in a noticeable improvement in efficiency.

It would seem that the proper place for high explosives is in artillery, where the wear is of small importance compared with other considerations. The extension of the range of pressures in engines, steam as well as the explosive type, shows that the end is by no means in sight and that with greater improvement in the material of construction still higher working pressures are probable. So far as utility goes, there may be something to learn from modern ordnance. Many of these engines of warfare are complex pieces of mechanism performing a number of functions, loading, firing and discarding the empty cartridges with great speed and under surprising strains. Length of continuous service is not a matter of years with machinery of this class, as compared with high efficiency for a short time and the injurious effect of the eroding gases is not nearly of the same degree of importance as in the case of engines for industrial purposes. But there are suggested in the improvements in explosives quite interesting possibilities. Greater control of the action, absence of smoke and gases which may be used freely and harmlessly in contact with the ordinary shop materials of machine construction, would permit anew the consideration by the designer of the application of high explosives to the peaceful purposes of industry.

Large Expenditures of the Erie Railroad.

The Erie Railroad has decided upon an elaborate plan of expenditure, involving improvements amounting to $27,000,000. The general scheme of expenditure is as follows: New York division, for revision of grades, passing tracks, third and fourth tracks, shops at Bergen, miscellaneous improvements on branch lines and Penhorn improvements, $11,250,000; Delaware division, side and passing tracks, $200,000; Susquehanna division, side and passing tracks, $220,000; Allegheny division, grade revision, double tracks, side, etc., $1,650,000; Meadville division, grade revision, side and passing tracks, $5,050,000; Leavittsburg to Marion, grade revision, side and passing tracks, $4,350,000; Marion to Chicago, grade revision, $1,100,000; Mahoning division, $1,000,000; Buffalo division, grade revision, side and passing tracks, $2,400,000.

For the first time in almost two years there was a sale of United States Steel Corporation first mortgage bonds last week in Wall Street. The sale of $26,000 worth of 5 percent series A bonds was reported at 100 and 100⅛. Shortly after the steel corporation was formed there was a sale of these bonds at 112. This issue of first mortgage bonds is in five series, from A to E, and amounts to $304,000,000. Of the total issues, $154,000 series A, C and E are subject to call after April 1, 1911, at 115.

The Labor Situation.

THE "OPEN SHOP" AND THE CIVIC FEDERATION.

The National Civic Federation, with headquarters in New York City, held its fourth annual convention in Chicago last week, and for several days carried on discussions on the relations of capital and labor. The meetings were held in Steinway Hall, Thursday, Friday and Saturday, and were largely attended. A banquet at the Auditorium Hotel Saturday evening closed the convention. All phrases of the labor question were discussed—the open shop, conciliation and arbitration, lockouts and boycotts, restriction of output, piecework and bonus systems, methods of payment, joint trade agreements, etc. No recommendations were made by the convention, but most of the speakers expressed an earnest desire to create a better understanding of the rights of the contending parties, as well as to establish more friendly relations. Former Judge A. N. Waterman, president of the Chicago branch of the Civic Federation, presided over the first day's sessions; Samuel Gompers, president of the American Federation of Labor, who is also first vice president of the National Civic Federation, was chairman at the second day's meetings, and Senator M. A. Hanna, president of the Civic Federation, was in the chair on the third day.

Addresses were made by Thomas Woodlock, editor of the *Wall Street Journal*, on "The Financial Outlook;" James Duncan, vice president of the American Federation of Labor and general secretary of the Granite Cutters' National Union, Washington, on "Where We Stand;" John M. Stahl, representing the National Farmers' Congress, Chicago, on "The Public;" Oscar S. Strauss, president New York Board of Trade and Transportation, on various phases of public questions, including "The Coal Strike and the Miller Case," "The Unorganized Public," and "Is Conciliation a Palliative Only?" Henry C. Hunter, commissioner of the New York Metal Trades Association, spoke on "The Open Shop;" John Mitchell, President of the United Mine Workers of America, on "The Closed Shop;" James O'Connell, president of the International Association of Machinists, on "Piece Work and Restriction of Output." J. W. Sullivan, president of Typographical Union No. 6, discussed the French system of "Co-operative Printing." Other speeches were made by Senator Hanna, Samuel Gompers, William H. Pfahler, former president of the National Founders' Association; T. K. Webster, president of the Webster Mfg. Co., Chicago; Marcus M. Marks, president National Clothing Manufacturers' Association; ex-Lieut. Gov. David Coates, of Colorado; W. L. Mackenzie King, of the Department of Labor, Ottawa, Can., and many others.

Henry C. Hunter on the "Open Shop."

The discussion on "the open shop" was probably the most interesting topic brought before the convention. It was introduced at the second day's session by Henry C. Hunter, of New York. Chairman Samuel Gompers gave free rein to the combatants and all vestige of a peaceful conference between capital and labor disappeared for a while. The lie was passed and for a time a dozen delegates were on their feet, each clamoring for a chance to take part in the discussion.

Mr. Hunter, in addressing the convention, first undertook to define a "closed" and an "open" shop. He spoke in part as follows:

"An open shop is a shop wherein the manufacturer hires workmen irrespective of their membership or nonmembership in a labor union. Wages are arranged by mutual agreement between the proprietor and each individual workman; or a number of mechanics, or all of them, may be members of labor organizations, and he may deal with them through the accredited officers of their organizations, but he never, by agreement or otherwise, surrenders his right to hire non-union workmen. This I understand, briefly, to be an open shop. At least, that is the open shop that prevails in the New York Metal Trades Association.

"The closed shop is where the proprietor agrees with a labor organization or a number of labor organizations, in case there are more than one trade employed, to hire only workmen who are members of the labor organization or organizations with which the agreement is made. The closed shop in the United States involves a further condition, that the labor organization with which the agreement is made must be an organization recognized as such by the American Federation of Labor. The open shop is the antithesis of the union shop and is one where the proprietor discriminates against union men. The union shop is one where the union men discriminate against non-union men.

"Now let us suppose that a manufacturer of lathes has a closed shop, and in all the departments of his factory only members of labor unions are at work. It may be forced upon him by the workmen being so well organized, or it may come from his own volition, believing that it is to his pecuniary advantage to have his shop a closed one. Whatever may be the reasons, we will admit that it exists.

"Now the cost of the production of lathes includes, among other things, material and labor. In the ordinary transaction of his business the manufacturer is required to deliver to his customers lathes at a fixed price, and he must of necessity deliver them at such times and places as may by contract be agreed between himself and his customers; or, if no date for delivery is fixed, then the delivery must be made within a reasonable time. He can contract with the sellers of materials to deliver him at such times and at such prices as are fixed between them, the materials necessary for the manufacture of lathes, and on the price thus agreed upon between him and the seller of material (in so far as material is concerned), he can estimate the cost of his lathes and fix the price for which he agrees to deliver them to his customers.

"If for any reasons the seller of the material fails to fulfill his contract for the sale and delivery of the materials he will be liable to respond in money for the damages thus sustained by the manufacturer; and in like manner the manufacturer must fulfill his part of the contract by paying the price fixed between him and the seller upon the delivery of the materials. Here are corresponding obligations backed up on each side by corresponding liabilities. The price of material may go up or down in the market, but whatever the conditions are the seller must fulfill his contract; or, in default, pay the manufacturer the damages sustained.

"Now, let us turn to the labor side of the cost of production. It may be a cold-blooded proposition to place labor in the same category with a material, but in the present state of the business world competition is the determining factor and when a manufacturer sits down to estimate the cost of a lathe the amount of labor required to produce it is resolved into dollars and cents and these are added to the cost of material to determine the cost of production.

"Stability in the market of labor is as absolutely necessary and essential to the successful conduct of a busines engaged in the manufacture and sale of lathes, as stability in the market of material. If there is a lack of sentiment in this statement, it is the fault of the social system under which we live and not that of the manufacturer. Therefore, the manufacturer is justified in saying to the labor unions as he says to the seller of materials: 'If I make a contract with you, can you deliver the goods, can you deliver them when and where I want them, and in case you can't fulfill your contract, are you in a position to respond in money for the damages I shall sustain by your breach?'

"Let us, therefore, examine the conditions of the closed shop of the manufacturer we have in mind. The shop is run strictly under union rules. Here are a few rules from the constitution of one of the most important trades unions employed in the manufacture of lathes:

"The following ratio of apprentices shall be allowed: One to each shop, irrespective of the number of members of the trade employed, one to every five members thereafter.

"No member shall operate more than one machine or accept work by the piece or premium system.

"Each lodge shall establish a minimum wage in its locality and no member of the organization shall work under that scale.

"Should a member vacate a position that was paying mor than a minimum rate paid to his class, any member accepting such position shall, within thirty days, receive the amount it formerly paid.

"When a member wishes to withdraw through being ap-

pointed a foreman or superintendent, he may be furnished with an honorable retiring card, provided that his salary be not less than $3,000 per annum.

"We thus find the men in almost absolute control of the labor which represents perhaps 60 percent of the cost to produce a lathe; men whose only responsibility is to complete the work of an hour, of a day, or, at the most, of a week. The manufacturer on his part must furnish the money to pay the wages, provide the shop with safe machinery and appliances on which the men work, and must respond in damages for the injury sustained by the employe through defective machinery. In addition to all this, he is alone responsible to his customers for the efficiency of lathes. The condition of the shop is thus in strict conformity to the ideas so well expressed by the president of one of the leading labor unions in the country in his address to the convention of this union, as follows:

"'Those who have watched the trade-union movement closely must realize that a rapid change has taken place; that the tendency of organized labor is toward the complete control of an industry. It is now up to the International Association of Machinists to take complete charge of the machine shops.'"

Mr. Hunter then recounted instances he had observed, illustrating the alleged control of work by unions, and continued:

"Then, there is the condition of deliberate and systematic restriction of output, which prevails, I believe, in some trades more than in others. And, what is worse than even this, is the loafing that prevails in some of the large shops. I saw the other day a report recently made to the management of one of the largest shops in the vicinity of New York by a man who had made a thorough investigation of loafing in this shop. The report showed men asleep, others reading newspapers, two or three men engaged on a piece of work that one could easily perform, and other similar acts that are comprehended within the meaning of the word 'loafing.'

"It was a shocking and lamentable condition. The management of this shop does not dare to cause a dismissal of these workmen, which would be almost wholesale, because it would result in a strike; if not in a strike, he would be obliged to hire other workmen, members of the same union, and possibly friends of the men dismissed."

Mr. Hunter then proceeded to show how the lathe manufacturer became involved in a sympathetic strike. "Assumed that he contracts for an engine with a Mr. Smith in Philadelphia. The engine is completed, but before it is shipped a strike occurs in one of the organized trades, and Mr. Smith, of Philadelphia, is put on the unfair list. He ships his engine to New York to be delivered to our lathe manufacturer. What happens? The manufacturer is waited upon by a committee, probably from his own shop, and he is informed that if the engine is installed, the members of the committee and their employes will strike. He may say to the committee that he knows nothing of the quarrel between Mr. Smith and his employes and that the contract for the engine was made before the trouble commenced; that it is absolutely necessary to have that engine put in his plant. He may also remind the committee that he has an agreement with their union. The committee, if they follow the action pursued under almost similar circumstances in New York, will state that this is a question of organization, and that the union has ordered if that engine is set up in the shop that the men must go out on strike."

Mr. Hunter told of the expulsion of two unions from the Central Federated Union of New York because of their refusal to violate their trade agreements, which he said had been negotiated before the strike was called.

"The next step in this warfare," continued Mr. Hunter, "for it has become such at this time, is to place the lathes of our manufacturer on the unfair list, and he is now in receipt from his customers of letters, and undoubtedly telegrams, telling him that the labor unions in the different parts of the country will not permit him to use his machines. This is the condition that he finds himself in: If he has the means and the perseverance to oppose the demand he may succeed. This the ordinary manufacturer cannot do, and he pursues one of two courses: grants the demands and his shops are closed by his creditors, or he continues to fight on, and in like manner the creditors close his shop. And then follow the obsequies over his downfall at a meeting of the Federation of Labor of the City of New York. What these ceremonies are I cannot inform you for all cases, but here is one case reported by the New York *Times:*"

Here Mr. Hunter read what purported to be a report of a meeting of the Central Federated Union of New York, at which it was stated the unionists present claimed that it was union labor that had brought about the suspension of the Morse Shipbuilding Co. and the placing of the concern in the hands of the receiver, and applauded the affair as a victory for organized labor.

The reading of this clipping brought several labor leaders to their feet who vigorously denied the truth of the report.

In concluding his speech, Mr. Hunter said: "These are a few of the conditions that the members of the New York Metal Trades have to meet, and I believe that they represent in a general way the conditions that almost every manufacturer is obliged to meet, where labor is strongly organized. Do you wonder, then, that manufacturers are opposed to the closed shop under the present condition of organized labor? In this discussion, I have stated the case of the employer as best I could and as fairly as I could from personal observation and experience. I would regret more than I can express if what I have said should be construed into placing myself into opposition of organized labor. I believe in labor organizations. They are the logical outcome of our present society. They have accomplished magnificent victories for the betterment and happiness of mankind. If I were a mechanic today, I would be a union man. I am opposed to the blots on the escutcheon of organized labor. I appeal to such powerful minds as our distinguished chairman, Mr. Gompers, to the Mitchells, to the Whites, to the Moffetts—grand examples of staunch American citizenship—to wipe out the blots of violence and shifting regard for obligations. I appeal to all organized labor to make the union card a passport of integrity of purpose and accomplished high ideals, an ornament to the already splendid heritage of American citizenship."

O'Connell on Piecework.

President O'Connell in discussing the piecework system declared that unions are not restricting output and claimed that the cure for this evil—and all other industrial evils—is the abolishment of the piecework method.

"With the proper superintending of a plant," said President O'Connell, "on a properly regulated basis of employment, the day base of wages would make it possible for all to enjoy a more prosperous livelihood, associate men, women, and children more closely together, ally them together in order that they may stand for a higher standard of manhood and womanhood. The piecework system cultivates selfishness both on the part of the employer and employe. We are a grasping people. Let us be honest with each other. It is dollars we are after, dollars and dividends. But we want to get these dollars and dividends fairly, without the necessity of crushing our brother man." President O'Connell then argued that the day of the individual has passed, and that hereafter the union, or association, must take his place.

Wm. H. Pfahler, formerly president of the National Founder's Association, denied this, and asserted that the labor unions are the only bodies that are trying to dispose of the individual and take from him liberties allowed by law. "Suppose I want to earn my living in a way that seems best fitted to me, in a place in which I can best do it. Have I the liberty? Who says I have not? Only the labor unions," said Mr. Pfahler.

J. N. Gunn, production engineer, of New York, and Henry White, of the garment workers, also spoke on the subject, after which President Frank Buchanan, of the ironworkers, took the floor. At the close of a general speech he took up corruption in the labor movement, and said that the trade unions will sooner or later weed out the men who are bought and who sell out their fellow workers.

Restriction of Output.

T. K. Webster, president of the Webster Mfg. Co., Chicago, reviewed the evolution in the machine shop which gave, instead of the "all-round mechanic," a man able to operate a single tool. With a lathe hand staying eight, ten, twelve,

fourteen years on that single tool it is nonsense to talk about individualism. Whether I like it or not, men, we are in a condition where we must live together; we are bound up in this thing and we can't help ourselves, and so, whether I like it or not, I say, 'Why, yes, ours is a union shop.' Mr. Webster won some applause from the union representatives by favoring an eight-hour day. "I don't come here to advocate unionism, but to say what I think is true. I believe that unions can succeed if they will drop certain principles. Let the best men be in the union and we have got to hire them. It does undoubtedly bring harmony into the shop, and if men are working in harmony you are getting a little work out of them.

"There is one evil that will wreck unionism if it is continued, and that is restriction of output. Mr. O'Connell says there is no restriction, and I hope he knows what he is talking about; but I have to tell you that I believe it is in the air that men are trying to get the limitation of output, and I think they are trying to get on entirely false grounds."

Mr. Webster then told of instances of restriction. He asserted that by the introduction of machine riveting, structural work could be improved, and 800 rivets handled in eight hours by four men. He said this was not done, for the unions have limited the work to 100 rivets, in spite of continual protests from the contractors.

Gompers Defends the Boycott.

President Gompers' address at the closing session of the congress was a review of the remarks of all the speakers that had preceded him, in which he took particular exception to some of the statements made. He said in part:

"It is crying the baby act for employers to find fault with our taking advantage of the law of supply and demand to better labor's condition, when they did not hesitate to take the advantage in times of industrial crisis. We are taking no unfair advantage, only obeying the mandates of the law of supply and demand. The pendulum is swinging toward labor just now."

"Count on my sympathy for the children rotting in the tenements and barracks rather than for the grapes that are rotting on the vines because a strike prevents their transportation."

"If a crisis comes and readjustment is necessary, divide the work among all. Consuming power will be lessened, but it will lift us out of depression sooner."

"The judge is the walking delegate to the lawyers' union. There is no open shop in the law trade. And if any man fails to live up to the ethics of the lawyers' union he is disbarred and not permitted to work at his trade. That is an imposition even unions are not charged with."

"Do we boycott? Of course we do. We all prefer to help our friends in preference to those whose hands are raised against us."

Senator Hanna's remarks were confined largely to a review of his own experiences with organized labor, in which he said he had not had a strike among his own men since 1874.

MEETING OF EXECUTIVE COUNCIL, N. M. T. A.

The executive council of the National Metal Trades Association held meetings in Cincinnati on Monday and Tuesday, Oct. 19 and 20. A number of important questions were under discussion. The council was well pleased with the progress made in the past six months. Members had been invited to present any complaints that they might have to make and in all the replies to this invitation not one complaint was made.

Among the matters under consideration was the time and place for the next annual general convention and it was decided to hold this convention in Philadelphia some time between March 15 and 31, 1904, instead of in April, and a recommendation was made that the constitution be changed so that future conventions may be held in March instead of April. A change in the constitution was also recommended which will be calculated to make the work in defense of strikes more effective, by lessening the routine formerly necessary to commence effective work in such emergencies.

It was decided to send a committee to represent the association at the meeting of the National Federation of Employers, and Commissioner E. F. DuBrul and W. P. Eagan, of Chicago, were appointed as such representation.

The *Bulletin* of the association was regarded as having done good service and action was taken looking to enlarging the scope and usefulness of the publication.

It was decided that monthly reports be issued to members of the association covering the conditions of general labor situation in various districts and the operations and work of the association.

A number of local employers' associations in different parts of the country have made advances to the N. M. T. A. to be taken in as a body and this matter was discussed by the executive council, but it was decided that it was not practicable to make such an arrangement, and that those belonging to such associations could only come in as individuals and on the same basis as other members. Overtures from several large organizations of employers, who wished to affiliate with the N. M. T. A., were also under discussion.

Much time was given to discussion of the best plans for protecting members of the association in the light of methods and experiences of the past.

It was the general comment of those present that there has been a slackening of demand in the various lines of business represented and that a period of retrenchment and moderation has been entered upon in the metal trades and allied industries.

The council expressed great satisfaction with the condition of affairs in the office of Commissioner DuBrul and complimented him and Secretary Wuest on the excellent system and methods employed and the efficiency of their work. There has been such efficiency in the office at Cincinnati that it has not been necessary to call any extra meeting of the executive council since the last regular meeting six months ago.

There was only one member of the council absent, F. B. Polson, of Toronto, Ont., and he telegraphed that he was ill. The association is making rapid progress. Nineteen applications for membership have been received so far this month. The meeting was highly gratifying to all concerned and was one of the most enthusiastic and earnest council meetings ever held by the association. Reports made showed that in the last six months more than $65,000 has been paid out by the association in aid of its members who have labor difficulties, but that not withstanding this expenditure the increase in funds on hand has been over $35,000. The association has assisted also in the establishment of 28 general employers' association and has increased its membership more than 56 percent.

The following were in attendance: S. W. Watkins, of Milwaukee, president; H. N. Covell, of Brooklyn, first vice president; J. W. Gardner, of Quincy, Ill., second vice president; F. A. Geier, Cincinnati, treasurer; E. F. DuBrul, Cincinnati, commissioner; P. O. Geier, Cincinnati, deputy commissioner; Robert Wuest, secretary. Councilors: G. F. Steedman, St. Louis; P. B. Kendig, Seneca Falls, N. Y.; W. P. Eagan, Chicago, Ill.; M. H. Barker, Boston; O. B. Kinnard, Minneapolis, Minn.; Carl Horix, Youngstown, O., and A. Falkenau, of Philadelphia.

CINCINNATI EMPLOYERS' ASSOCIATION.

At Cincinnati last week the Cincinnati Employers' Association was organized, starting with a membership of 500, chiefly members of local manufacturers' associations. Business men, whether employers of labor or not, are eligible to membership, the principal object being to fight the boycott. The identity of the members is not made public, that being the policy. It is expected that the Cincinnati association will soon have a membership of 2,000 and eventually a Citizens' Alliance will be formed, taking in citizens in all walks who believe in stamping out the boycott and coercion. In Kansas City the Citizens' Alliance has 6,600 members, in Denver 14,000 and in Scranton 10,000. The movement has enlisted unexpected interest, and there is a willingness never seen hitherto to unite in opposing the intimidation and boycotting which have had so baneful an effect upon the business life of certain communities.

LABOR NOTES.

Although the strike order at the Stark Rolling Mill, Canton, O., went into effect Oct. 14, the mills are running and

the company claims that it has suffered no inconvenience from the order being issued.

There are now comparatively few strikes among the iron molders, and these are in process of adjustment by officers of the Iron Molders' Union and the National Founders' Association. The strike at Moline, Ill., is one of the most troublesome still hanging on. The Birmingham, Ala., strike, which was declared off by the men last week without the granting of the nine-hour day, lasted more than a year.

The Central Foundry Co., New York City, is considering the advisability of closing its plant at Vincennes, Ind., because of unreasonable demands of union labor.

Railway machinists on the western section of the Baltimore & Ohio Railway have been granted a 10 percent increase in wages, and boiler-makers all over the system have been given an increase ranging from 8 to 10 percent.

About 100 men are still out at the Erie Foundry Co.'s plant, Erie, Pa., because of the introduction of a molding machine.

The boiler makers of the Sountern Railway shops, Atlanta, Ga., returned to work last week, after being on a strike for three weeks. The strikers demanded an increase to $3.50 per day, but were granted nothing.

A decision in favor of the employers has just been made in the Gibson County Circuit Court of Indiana, a contracting builder recovering damages against a local union of the Brotherhood of Carpenters and Joiners, by which he had been placed on the "unfair" list. Although the damages awarded by the court were only $40, the principle established is considered important.

Henry Farley, a walking delegate, who is waiting trial in New York City on an indictment for perjury alleged to have been committed in testimony which he gave during the trial of Sam Parks, is said to have made a startling confession to District Attorney Jerome. He cites many cases in which walking delegates have extorted money from contractors and builders to avoid strikes or have them called off.

The executive board of the Iron Molders' Union is in session at Cincinnati this week, passing on a number of questions of general import.

At Cincinnati Judge S. W. Smith granted a temporary order against the striking molders at the Lane & Bodley Co.'s plant, restraining them from intimidating, visiting families or using threats or violence, though not against picketing, but there was a caution given against using other than friendly efforts to induce the workmen to quit the company's employ.

American Boiler Manufacturers' Meeting.

At the meeting of the American Boiler Manufacturers' Association, which will be held in Chattanooga, Nov. 10 to 13, the principal subject to be discussed will be the revision of the boiler laws of the United States Steamboat Inspection service. This association was founded in 1889 and its first work was the adoption of standard materials which have since become known to the trade by the initials of the association, A. B. M. A. The next step was the appointment of a committee on uniform boiler and inspection laws, and much good has been done in this way, but there is now urgent need for revising the laws, and it is expected that a committee having the subject in charge will make an interesting report at the Chattanooga meeting. The removal of General Dumont from the position of inspector general has caused some delay, but it is expected that his successor will make some important recommendations to congress in his forthcoming report.

At a meeting of the board of directors of the Weaver Coal & Coke Co., Chicago, last week, Henry E. Weaver, formerly president, resigned and was succeeded by C. S. Roberts, who was formerly secretary of the American Steel & Wire Co. Mr. Weaver was made first vice president and general manager, and Cornelius A. Bickett was elected second vice president. The change was made with the full approval of Mr. Weaver, who desired to be relieved of the financial management of the company that he might center his energies in the direction of the physical properties of the corporation. The directors present at the meeting included John W. Gates, Henry E. Weaver, H. A. Gardner, Thomas Gahan and Cornelius A. Bickett. The capital stock of the company, which at present is $3,000,000, will be increased in the near future with a view to acquiring more coal lands.

M. H. Treadwell & Co., of New York, have decided to make a number of important changes in their plant at Lebanon, Pa. The machine shop will be entirely remodeled. The present building is 200 feet long and 60 feet wide. A crane runway will be erected, on which will be operated two 15-ton electric traveling cranes of the firm's design. This runway will extend through the shop and 150 feet to the west, giving the shops ample room for erecting, loading and unloading purposes and will of course greatly facilitate the present methods of handling material. The galleries on the side of the main shop will be used for light machines as turret lathes and screw machinery and at each end of the gallery will be located two electrically driven elevators. A standard gauge track with a narrow gauge track will extend the entire length of the building. The machinery will be rearranged in the machine shop; electric lights, both arc and incandescent, will be introduced throughout the shops with a complete heating system. The power plant, pattern department, car construction shop and foundry have also received large additions to their general equipment.

Wilmarth & Morman Co., Grand Rapids, Mich., reports a falling off in its shipments of drill grinders during September, though the business done in August was 50 percent greater than that in the same month a year ago. Among some of the shipments of "New Yankee" drill grinders since the first of last month we are advised of the following: Gardner Machine Works, Gardner, Mass.; Erie Railway Co., Meadville, Pa. (two machines); H. Bower & Co., Tecumseh, Mich.; Patterson Tool & Supply Co., Dayton, O.; Pennsylvania Ry. Co., Lambertville, N. J.; E. A. Walker, Philadelphia; Vaughn & Rood Machine Co., Peabody, Mass.; Marine Mfg. & Supply Co., So. Dakota Agricultural College, Brookings, S.D.; DeLaval Separator Co., Poughkeepsie, N. Y.; Ford City Foundry & Machine Co., Ford City, Pa.; Newport News Shipbuilding & Dry Dock Co., Newport News, Va. Drill grinders were also sent during the month to the following countries: One to Canada; one to South Africa; two to Japan; and six to England. The company reports also a good demand for arbor presses and for the Nelson loose pulleys.

At the annual meeting of the Steel Wheel & Wagon Co. held recently at Pueblo, Col., W. H. Schofield resigned as president and general manager. Fred O. Roof was elected president and R. M. Wait, formerly chief clerk of the Colorado Fuel & Iron Co., was elected manager. It is stated that Mr. Schofield's resignation was due to a disagreement as to the business policy of the company. The announcement caused some surprise in view of the fact that he originated all the designs and patents under which the wagon is now being built, and after promoting and financing the company had charge of the construction and operation of the plant until last month. Mr. Schofield has taken up his residence in Chicago. He is still largely interested in the Pueblo company and is devoting himself to perfecting new designs for metal wheel and wagon construction. The Steel Wheel & Wagon Co. has arranged with some of its original stockholders to double the present capitalization.

The Standard Roller Bearing Co., of Philadelphia, has purchased the entire fall business of the Grant Tool Co., Franklin, Pa. (formerly of Cleveland, O.), and is prepared to fill all orders for the Grant ball. The business will be run for a short time in Franklin, so that orders can be filled without delay, but it will eventually be moved to Philadelphia and consolidated with the Standard Roller Gearing Co.'s plant in that city. R. H. Grant, formerly manager of the Grant Ball Co., will have charge of the ball making plant in Philadelphia, and a number of the former employes of the Grant Co. will remove from Franklin to Philadelphia, and enter the employ of the Standard Roller Bearing Co.

Perkins & Co., of Grand Rapids, Mich., are going to erect a new foundry, 60x80 feet. The building will be of concrete construction.

National Convention of Implement and Vehicle Manufacturers.

The tenth annual convention of the National Association of Agricultural Implement and Vehicle Manufacturers is being held in Cleveland this week. The attendance is large and the prevailing feeling of the members, who represent many of the leading manufacturing concerns of the country, is that while boom times are passed and there is necessity for caution in conducting business, there is no ground for expecting such depression as was experienced in the early nineties. The immense crops and the high price of cotton, which has filled the pockets of Southern farmers, are cited in support of the belief that the country has a solid basis of prosperity which cannot be shaken even by the excesses of Wall Street and the unjust demands of labor.

The members met informally Tuesday evening at a delightful smoker, with choice music and high class vaudeville, all in charge of the local committee, of which R. S. Pierce is chairman. Wednesday morning the convention, which completely filled the large assembly room of the Hollenden, was called to order by President Martin Kingman. After prayer by Rev. Ward Beecher Pickard, of Cleveland, City Solicitor Newton D. Baker, in an exceedingly happy address, welcomed the visitors to Cleveland. W. S. Thomas, of Springfield, O., in an address which, like Mr. Baker's, was heartily applauded. President Kingman then read his address, which was in part as follows:

Labor Problem.

"You are well aware that the labor problem has been and is a subject of very great concern to every manufacturer. The question, in my opinion, is destined to grow in interest from month to month. The very high rate of wages set by many leading corporations of this country, which were and are abnormal, have in my opinion worked great injury. Such wages were entirely too high to be maintained, and it is my belief that sooner or later these industries must reduce the present wages or they will be unable to meet, as they must in the near future, the emergency of lower priced material.

"The scale of high wages by leading corporations has induced all other labor to feel that like wages should be paid to them, while, as you know, in our manufactures we have not been able to increase the prices, to any large extent, of our implements or vehicles; at the same time we have been obliged to pay increased prices for both material and labor. The condition of most of the manufacturers of this association, during what has been termed the "prosperous times" of the past two or three years, has thus been, to the contrary, unsatisfactory and in many cases unprofitable.

"During the past year I have received many communications from members of this association, asking me as president to take a decided stand in favor of the non-union shop. I felt that this was a matter of so very great importance that I was unwilling to assume any such responsibility. It is even a question whether this association ought to, or would care to assume such a responsibility. At the same time I wish to express the opinion that labor agitations in this country are of such a nature and menace that if continued for another year or two business will be forced to a standstill.

"Many labor organizations without giving due consideration as to whether the manufacturer is doing a paying business or not, are simply considering what wages they can demand and get, to serve their own ends. This agitation by the laboring element has grown until it has caused, as was stated during Labor Day at Chicago, the formation of upwards of four hundred labor organizations in that city alone. These organizations comprise every line of industry from the boot-black, bell-boy, teamster, cook and laundryman to the skilled mechanic and railroad trainmen.

"This same state of labor is now, and has been the condition in England for several years. The result is that England has been losing her foreign trade because she was unable to compete in prices with Germany and other countries who were upon a lower basis of prices for material and labor.

"Mr. Chamberlain, the ex-colonial secretary of England, has seen this growing decline of Great Britain's foreign trade, and it has had such a marked effect upon him as to force him to resign. He is now seeking to bring about a reform through the laboring element. We gather from press dispatches that to a certain extent he is succeeding.

Trusts.

"The organization of trusts and the screwing up of prices have been the order of the day. While this is an era of consolidation even to solidified air, it may prove too intense for ordinary respiration. It is hardly a question that the trusts have carried their tightening measures too far, both for their own good and for those whom they supply. In other words, there is too much common stock.

"The members of this association who are manufacturers know how thoroughly trust organizations control the price of almost everything which enters into the construction of our implements and vehicles. The time has passed when the shrewd buyer could secure closer and lower prices; now one must simply either take the material or let it alone. While this condition would be satisfactory if prices were reasonably low, it is all wrong when prices are abnormally high. The labor question and the trust question are upon the same basis. Prices must be regulated to suit changed conditions. With a reduction in the price of labor, trusts must govern their prices accordingly.

"You may say to the speaker, 'You are talking against labor and trusts; and the difficulty with you is that you are not in a trust because you were unable to form one.' The speaker acknowledges the advantage of belonging to a trust. 'You are all right if you are in, and all wrong if you are out,' is the saying; nevertheless the successful large corporations are those that make uniformly low prices to the manufacturer and consumer. That is what this association wants. Stability and uniformity of prices are essential to a successful and prosperous manufacturing business.

Reciprocity.

"The question of the membership of this association and their duty to reciprocity is one that no doubt has been of great concern to each member or manufacturer. It is truly an all-important matter and I believe that if we are considering the best interests of our business we cannot but be in favor of reasonable reciprocity. Such an attitude must bring about a revision of the present Protective Tariff. The United States is growing so very rapidly, and its productions of manufacture are such that they must have an outlet. Within the past twenty-five years the increase in the number of factories has been three-fold. The total value of manufactured products in 1880 was, in round numbers, about five billions, as against upwards of fifteen billions at the present time. With this increased productive power there has been an increased consuming capacity, but not nearly equal to that of the production. The question now is, 'What shall we do with our surplus products?'

"This brings us to the question, 'How can we increase our manufactures and how can we sell this increase in foreign markets?' To my mind, one of the best ways is by reciprocity."

Foreign Markets.

President Kingman earnestly advocated reciprocity with Cuba and Canada, and in conclusion said:

"The demand abroad for our manufactures, while still well maintained, does not give that promise for an increase in the future, at this time, that it has in the past. The latest statistics of experts are not so encouraging as those who are studying the subject have felt they ought to be. On the whole, we cannot hope for any great improvement soon in increased foreign demand for our manufactured products, excepting, possibly, iron and steel. Foreign countries are all struggling for supremacy in foreign trades. England has heretofore led the markets of the world in her manufactures, but Germany is fast coming to the front with her great energy, and is steadily making headway.

"To a certain extent the industrial world today is arrayed against the United States, and a series of questions which the manufacturers of the United States must consider is, Will we be able to hold the trade that they now have, and to increase

it? With labor agitations and consequent rise in wages upon one hand; with trusts and high prices of raw material on the other; with the energetic and determined competition by European powers confronting us, we may well pause in answer to these questions. Certain it is that the time demands increased union of interests on the part of our manufacturers and more careful study of trade problems than ever before. If we are to maintain our supremacy in foreign markets we must oppose the aggressiveness of Great Britain with equal determination and energy, and by our own wise and intense researches overcome the power of Germany in the scientific study of trade management."

Executive Committee.s Report.

F. E. Meyers, chairman of the executive committee, who will in all probability be the next president of the association, submitted the report of that committee, which was, in part, as follows:

"The work and results accomplished by the freight department are, perhaps, of greater importance and real value to the individual members of the association than that performed by any other committee. Frequent meetings were held during the year. The personnel of this committee is largely that of skilled traffic managers, whose experience means much in the securing of results. Think of the time given by them to this work day after day that could not be bought for thousands of dollars, and practically without cost to the association. The results secured in this department alone have been worth many times the cost of membership to every member of the association.

"Reciprocity with Canada, in the judgment of your committee, is one of vital importance to the association. Several recent trips into Canada, during one of which your chairman was present at a commerce convention at Montreal, where he met representatives of nearly every province under the flag of the Dominion, and a subsequent visit at the Toronto exposition thoroughly convinced him that the manufacturers of agricultural implements and vehicles did not fully comprehend the vastness of that country, the thrift of its people, and the importance of attending our conventions and taking an active part to secure improved conditions and greater interest in the legislation that is being enacted on the other side. Farmers are emigrating there from the United States by thousands and want our implements. Recent laws compel us to manufacture there or forfeit patents. Canadian manufacturers attend our conventions and profit by our methods. What are we doing in that direction? Your committee earnestly recommends some action that will familiarize our members with present and possible future conditions."

Mr. Meyers urged the importance of exercising extreme care in preparing goods for export. He said in part: "It is to be regretted that some manufacturers have used very poor material; others have been decidedly slack in workmanship and finish, while others have not shipped what they sold and sold and shipped what they knew was faulty in construction and adaptation or out of date. This will not do and must be corrected, if we expect to secure cash on delivery or rendering of bills of lading, and extend our foreign demand."

The report opposed eight-hour legislation, saying: "We wish to retain our foreign commerce. This will employ our artisans; and to retain our commerce we must work strong men nine to ten hours, even if we have to pay more. First of all, we must be fair, then, as manufacturers, who work men, not boys and girls, who perhaps should not work more than eight hours."

The Secretary's Report.

Frank E. Lukens, the energetic secretary, to whose efforts much of the prosperity of the association is due, submitted his report. He said in part:

"While you have made a substantial gain in membership, as will be shown by the report of your membership committee, the coming year promises to be the banner one in this respect, if the recommendations of the various committees are adopted. There are hundreds of manufacturing concerns, having a capital of less than $50,000, who, I believe, would become members if the annual dues are made proportionate to the capital invested. With a large increase in the membership comes added influence and power to accomplish the association's objects, making it of greater benefit to a greater number."

The receipts for the year were $7,117.37, and the disbursements $6,496.93, leaving a balance of $620.44 and uncollected dues $600. The members employ in all 150,000 men. They receive and ship annually 8,000,000 tons of freight.

Entertainment Program.

An elaborate program of entertainment has been prepared by the local committees, including a theater party Wednesday evening, and the crowning event of the convention, the banquet, this evening, in charge of a committee of which N. D. Chapin is chairman. The visitors are enthusiastic in commending the completeness of all arrangements for the transaction of business and for enjoying the entertainment hours.

Frank B. Baird, who has been interested in the operation of the charcoal furnace at St. Ignace, Mich., announces that he will move the furnace to Boyne City Mich. St. Ignace furnace was overhauled and put in operation about a year ago, but was visited a few months ago by fire, which destroyed the trestles, stockhouse and a large supply of charcoal. Mr. Baird has decided to move the plant because at Boyne City the charcoal problem is solved by the proximity of a large supply of hard wood. The company will obtain its charcoal supply from the Boyne City Chemical Co., which utilizes the by-products.

The Marinette Iron Works, Marinette, Wis., have closed a contract with the Chicago Heights Land Co. to locate at Chicago Heights, Ill. New buildings will be constructed at once. The dimensions are: Machine shop, 80x350; foundry, 80x250; machine shop, 70x200; blacksmith shop, 50x80; tool room, 40x40; boiler and engine room, 50x75; pattern shop, 50x100, two stories high. The machine shop and foundry will be equipped with 10, 20 and 40-ton electric traveling cranes. Boilers, engines, tools, etc., will all be new, and the plant will give employment to over 600 skilled mechanics.

Although the secretary of the navy has not yet made a formal decision, it is understood that the contract now pending for armor plate will be divided among the Carnegie Steel Co., the Bethlehem Steel Co., and the Midvale Steel Co. Bids were opened Oct. 1, when it was found that the first two concerns had bid the same, $6,944,000, while the bid of the Midvale Co. was $6,606,932.

P. H. Brundage, of New York, has entered suit in the United States court at Wilmington, Del., against the Lobdell Car Wheel Co., to show cause why it should not be compelled to enter the National Car Wheel Co., a consolidation recently formed. It is understood that under the will of the late George G. Lobdell, the concern cannot be sold to a consolidation or company.

The American Seeding Machine Co. has declared its second quarterly dividend of 1¾ percent on preferred stock. This company was organized on a conservative basis during the present year, and is prosperous. It has increased its surplus account by net profits more than double the dividend payments.

Nearly 300 men employed in the rolling department of the American Steel & Wire Co., Worcester, Mass., have been laid off. A number of other plants in Worcester have decreased the number of their employes, or entirely shut down.

President Buffington, of the Illinois Steel Co., has issued a statement in which he says that the company has no intention of closing any of its plants. He adds: "A few men have been laid off at Joliet, but the plant has not been closed. It is simply a case of business being dull for a short time."

CRUCIBLE STEEL CO. OF AMERICA.

(Special Telegram.)

NEW YORK, Oct. 21.—The annual meeting of the stockholders of the Crucible Steel Co. of America was held at Jersey City today. The third annual report for the fiscal year ending Aug. 31, 1903, was presented and showed net earnings of $1,522,550.27 as compared with $3,552,467.94 the previous year, a falling off of $2,029,917.67. The net earnings are insufficient to pay the 7 percent on the preferred stock and it is altogether probable that at the meeting of the board of directors to be held in December to pass upon the dividends the preferred dividend will be passed. In addition the Crucible Steel Co. has guaranteed bonds bearing 5 percent interest to the amount of $10,250,000 issued for the erection of the Clairton plant requiring $512,500 to meet interest. The report shows further that a loan of $5,000,000 has been arranged for, secured by the pledge of certain stocks and securities owned by the company to complete the Clairton plant. The report of President Frank B. Smith is in part as follows:

"For the fiscal year ending Aug. 31, 1903, the net earnings are $1,522,550.27. This result is very much regretted and is due, to a large extent, to the fact that the management, confident in the belief that the construction of the Clairton works would be completed in season to supply them with their raw materials at reasonable prices, were forced to purchase the material in the open market at the high prices prevailing the first six months of the year. This in connection with the heavy reduction in the market prices of raw material during the past three months, and the necessity for giving these reductions due consideration in making up the inventory, will account for the great reduction of profits for the current year. This condition of affairs will not exist during the coming year as the Clairton Steel Co. plant is now in full working order and able to supply this company with a very large proportion of its requirements of raw material.

"The plants of the company have been maintained in good condition and all repairs have been charged to operating expense. The betterments for the year amount to $326,858.09.

"A clerical error in the financial statement for the year 1902, when verfied, was duly reported to the board of directors and by its instruction was charged to profit and loss account. This reduces the surplus to $1,866,141.64, as of Sept. 1, 1902.

"The new plant for the manufacture of cold rolled steel and fine wire, located at West Bergen, which was under construction at the time of the last report, is now about complete and in partial operation. It is expected that the near future will find it in full completion and operation.

"The export trade referred to in the second annual report is being vigorously canvassed by the various representatives in foreign parts with good results. The financial statement follows:

ASSETS.

Real Estate, Plant and Equipment	$42,351,580.93
Betterments	326,858.09
	$42,678,439.02
Investment Securities	$ 1,810,312.57
Accounts and Bills receivable	3,911,349.93
Cash	708,685.20
Inventory	7,399,220.72
	$56,508,007.44

LIABILITIES.

Capital stock, preferred	$25,000,000.00
Capital stock, common	25,000,000.00
Accounts payable	4,403,895.54
Park Steel Co.	27,919.99
Pfd. dividend No. 12, payable Sept. 29, 1903	437,500.00
Surplus	1,638,691.91
	$56,508,007.44

"The failure to conclude the agreement with the United States Steel Corporation for the sale of a one-half interest in the Clairton Steel Co. has placed the company under the necessity of securing additional funds required for the successful operation of that plant. The board of directors has arranged for a loan of $5,000,000, secured by the pledge of certain stocks and securities owned by the company and sufficient subscriptions to such loan have been secured to assure the financing of that company. The general business condition, as evidenced by orders being received and in hand, justifies the belief that the demand for the company's products will continue."

(Special Telegram.)

PITTSBURG, Oct. 21.—At a meeting of the directors of the Crucible Steel Co. of America, held here yesterday afternoon, W. G. Park was elected chairman of the board and was given full executive authority in the management of the concern. After the meeting President Frank B. Smith issued the following statement: "There will be no other changes in the officers of the Crucible Steel Co. than those already announced. The last meeting of the board of directors preliminary to the annual meeting of the stockholders, which is to be held in Jersy City tomorrow, was held this afternoon and the election of Mr. Park as chairman of the board was made. Satisfactory financial arrangements have been made for the Clairton plant, but they will not be announced now."

M. A. Neeland, of the William Tod Co., Youngstown, O., returned from a two months' trip to Europe this week. While abroad he investigated the operation of gas blowing engines thoroughly, and if his report is favorable the William Tod Co. will engage in the manufacture of gas blowing engines.

The first annual meeting of the Manufacturers' Association of Pittsburg was held in the Lewis Bldg., Pittsburg, on Monday, Oct. 19. Officers for the ensuing year were re-elected as follows: George Mesta, president; I. W. Frank, vice president; Joseph A. Speer, treasurer; F. H. Zimmers, secretary; executive committee, W. H. McFadden, John Jackson, G. E. Brush and Stewart Johnson.

Upwards of 100 engineers and foundrymen of Pittsburg inspected the new foundry of the Westinghouse Machine Co. at Trafford City, Pa., on Saturday, Oct. 17. This plant was described and illustrated in the Oct. 1 issue of *The Iron Trade Review*. On Saturday evening there was a formal opening of Trafford Inn, attended by a large number of the Westinghouse employes and their friends.

As soon as the foundry of the Westinghouse Machine Co., Trafford City, Pa., is in full operation, the present foundry at East Pittsburg will be discontinued and the machine shop at this plant extended. The machine shop at the Walker plant, Cleveland, O., will be removed to East Pittsburg, while the room formerly occupied by the machine shop at the Walker plant will be utilized in extending the foundry at this plant.

Before the first of the year the new plant at Ludlow, Ky., of the Norton-Edgar Can Co., Inc., the president of which is H. M. Norton, formerly of Norton Bros., Chicago, who manufactured the Norton can, will be opened. Norton Bros. sold to the American Can Co., of which the new company promises to be an important competitor.

The Sharpe Machine Co., Quincy, Ill., recently incorporated, will manufacture metal working tools and machinery. Its specialty will be presses, dies and machinery for the production of articles of sheet metal. The officers are: J. W. Sharpe, president and treasurer, and Wm. Meyercord, secretary. Temporary offices are at 834 South Fifth St.

The Ransom Mfg. Co., Oshkosh, Wis., advises us that while it has had a good demand for small grinders, it has noticed quite a falling off in inquiries and orders for heavy machines during the last thirty days.

The Eureka Trolley Co., capital $30,000, Ironton, O., has been incorporated by R. N. Fearon, Thos. L. Collett, Sylvester Stitts, Royal Elmer and J. C. Snyder, to manufacture trolley wheels.

A petition has been filed at Chicago to have the Chicago Motor Vehicle Co. declared bankrupt. The liabilities are placed at $250,000 with assets of $200,000. The company employs 1,000 men.

A NEW CRANK SHAPER.

A 16-inch crank shaper has been recently designed by the Queen City Machine Tool Co., of Cincinnati, and is made either single or with back gears. The weight of the plain machine is 2,350 pounds net with countershaft, and the weight of the back geared shaper 2,450 pounds with countershaft. The builders assert that the tool is the strongest and most powerful shaper of its stroke on the market and has been designed in order to get the full benefit of the new high grade tool steels.

The column is of large proportions, and is reinforced to resist working strains. The rail is heavy, thoroughly ribbed, and has wide bearings, which also protect the vertical screw from injury. The horizontal traverse screw is provided with a graduated collar indicating thousandths of an inch. The vertical adjustment is effected by means of bevel gears which are protected from chips and dirt.

The ram is a novelty in shaper construction and is so designed that it loses none of its rigidity when in the extreme forward position.

The depth of the ram increases at middle, and consequently the construction is heavier as the tool passes over the work and away from the column. The stiffest part of the ram is in use at the time when the leverage is greatest and in this manner the spring of the parts is largely overcome.

The gibs are proportionately heavy, and hold ram and rail to column in a very efficient manner. The adjusting gibs in head and ram are firmly held by screws fitted with lock nuts countersunk flush with casting. The head swivels to any angle and is graduated; the locking device is strong and convenient, and the down feed screw is provided with a graduated collar indicating thousandths of an inch. The rocker arm has a simple adjustment to compensate for wear of crank shoe.

The table is box form, T slotted on top and sides, has V for holding shafts and similar work vertically, and can be readily detached from apron. The vise is very heavy, has a circular graduated base firmly bolted to table, swivels to any angle, can be attached to top or side of table, and the jaws are annealed steel. The graduated base is secured to table by 4 bolts and when vise is swiveled to an angle it is firmly held to base by 2 bolts.

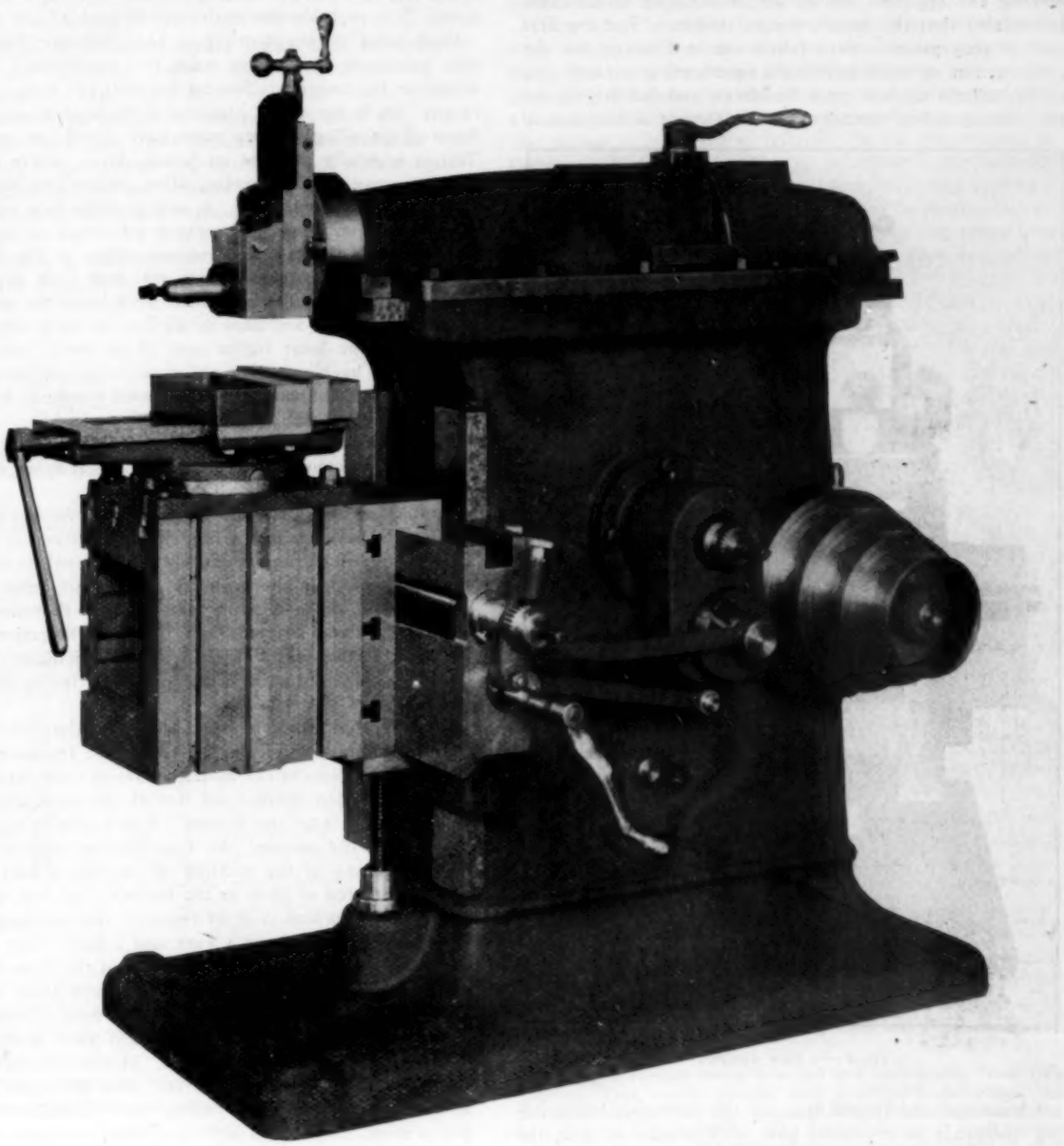


FIG. 1.—THE QUEEN CITY MACHINE TOOL CO.'S NEW SHAPER.

All flat bearings are scraped to a standard surface plate, and all wearing surfaces are so gibbed as to permit of close adjustment for wear. All circular bearings are unusually long, and bushed, thus providing for the maintenance of original centers. The vertical traverse screw is provided with ball bearings.

The materials are carefully selected. Means have been provided for perfect lubrication. All gears and T slots are cut from solid stock. An opening under the ram is provided for key seating of shafts and similar work of any length. The length of stroke can be quickly changed and locked from working side without stopping machine. Table support can

be furnished when desired. The feed gears are covered; not only to protect the gearing, but to avoid the danger from open gears at this point. All wrench connections are hardened.

The principal dimensions are as follows: Actual length of stroke 16½ inches, vertical traverse of table 14¾ inches, cross traverse of table 21 inches, feed to head 6¾ inches, top of table 12x11 inches, side of table 12x13½ inches, length of ram bearing in column 30¼ inches, key seating capacity 3 inches, vise jaws 9¼x2¼ inches, vise opens 7½ inches.

The *Construction News*, of Chicago, in a recent issue corrects a statement which appeared in these columns concerning the apparent falling off in building at Chicago. It explains that this is not due to strikes. "For the first half of 1903 permits were taken out in Chicago for the construction of 2,976 buildings, aggregating a total cost of $17,028,260 against 3,101 buildings and $28,817,105 for the corresponding period of 1902. This is a decrease of

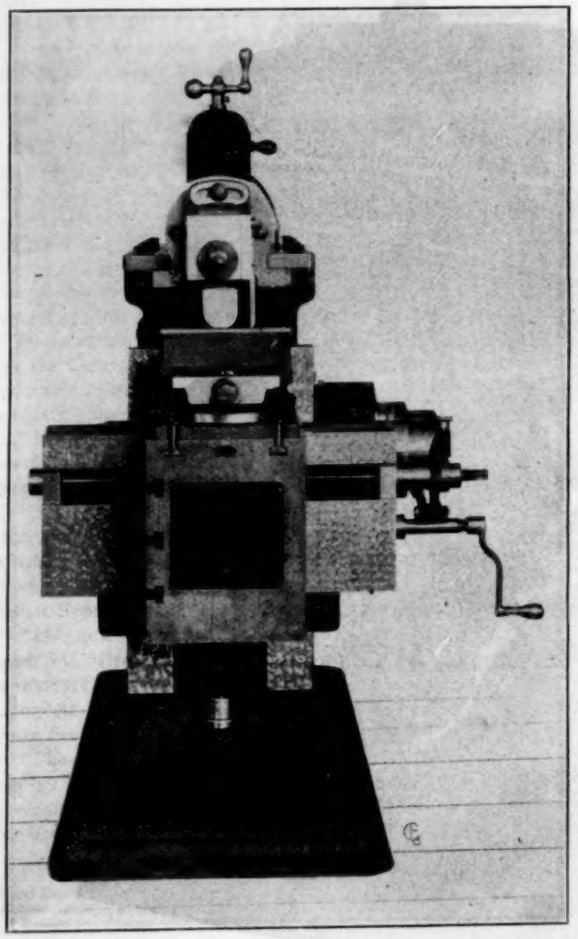


FIG. 2 —A NEW SHAPER.

125 buildings and $11,788,845. By the change in the building ordinance in the latter part of February of 1902, the limit of height—which was 130 feet—was practically done away with. Prior to that a large number of owners were ready to go ahead with the construction of lofty buildings while a number of others, more in the nature of speculators, were also discussing the subject. When the limit of height was changed they flocked in to secure permits under the law as it had been changed, and within a few days after the new ordinance went into effect it was reported that it would be amended and the limit of height again fixed at 130 feet. This report was responsible for a still greater increase in the number of applications for permits. Permits were taken out for a large number of buildings, many of which have never been erected and some of which may never be built. The building business is not demoralized in Chicago because of the labor troubles."

LAKE SUPERIOR IRON MINES.

L. Kennedy, James Hollister and Mrs. S. P. Hollister have executed an option to the Enterprise Mining Co., of Stevens Point, Wis., on the N. W. ¼ S. E. ¼ Sec. 25, Town 38, 1 W town of Worcester, about 3½ miles north of the town of Phillips, Wis., to mine for copper and iron. Operations will soon be begun. Mr. Kennedy discovered minerals on the land a dozen years ago.

Diamond drill operations west of the Chandler mine, Vermillion range, have been stopped, no indications of ore having been found. At Section 30-63-11, where three drills are at work, they are forced to ream out the holes and will case down. It is probable that shafts will be sunk to find the ore.

From many mining districts of Lake Superior foreigners, who have been working in mines that have closed for the winter or for longer, are leaving for their old homes, not to return. Many Austrians, Fins and Poles have already gone. Some of the villages where mines have closed are very dull. This is especially the case at Amasa, Mich., where nothing remains active, and at Soudan, Minn., where the Minnesota hard ore was the only mine. It will probably be a long time before this latter property is running with much activity.

Explorations increase and interest grows in the Baraboo ore district, and more and more drill men from Minnesota are at work there. The growth of work keeps the supply of drill runners short, and takes up all that are made idle on the Mesabi. In the latter region most of the small independent explorations have ceased or are about to do so, but the big firms have work on hand they had planned to take up whenever there was a slack time in contract drilling.

The Jordan mine, 58-20, Mesabi range, has closed for the season. Its shipments have not been as large as expected early in the season. It is a Corrigan mine.

Capt. Marcus L. Fay, of Virginia, and W. H. Yawkey, of Detroit, have secured a four months' option on the old Taylor mine in Baraga county, Mich., and will at once begin exploration on the property. The mine, after having been opened and a quantity of ore taken therefrom, was abandoned about 20 years ago, owing to litigation which was not settled until recently. The Michigan Iron & Land Co., of Marquette, Mich., owns the fee of the property.

Considerable work is being done by the Oliver Iron Mining Co., in its mines in the vicinity of Ironwood. The new A shafthouse at the Norrie is nearly completed. The shaft will be put down 1,500 feet at the start, and is expected to tap large ore bodies. A new power house will be built in the spring. At East Norrie engineers have made a survey of the location of the No. 3 shaft which is to be started at once in the footwall 236 feet south of the old shaft which it is to replace. The sinking of the shaft will require about a year and a half. Out on Sec. 13 the work of sinking a shaft north of the New Davis is progressing favorably. At the Puritan a shaft is being put down to the ore bodies which lie deep at that point.

On the Menominee range the night shift at the Great Western mine has been laid off. A small force will be kept at work during the winter. The Michigan mine is now closed, all employes having been laid off except the pump men. No orders have yet been received to curtail the force at the Hemlock. None of the stock pile of 50,000 tons has been used this summer. The old stocking ground is full and it will be necessary to prepare new ground to hold the ore that is to be hoisted this winter. For this purpose a survey has been made along the railroad track and the work of grading is to be started soon. Underground the work of opening the new level that was added last winter will be prosecuted. At the Bristol about 200 men are now employed and an effort is being made to clean up the stock pile before the season closes. The work of preparing for the new construction and the additions to the steam and hoisting plant is going on steadily.

Mining operations were resumed at the Great Western mine of Corrigan, McKinney & Co., last week. The men who had been at work in the mine previous to the shutdown had al-

most all gone to other properties, and some difficulty was experienced in getting a force of miners.

The Champion mine on the Marquette range has been closed and about 350 miners thrown out of employment. The suspension is attributed to the failure of the United Steel corporation to purchase a half interest in the Clairton Steel Co., which operated the Champion property. The ore stocked at the Champion is close to 250,000 tons.

The Biwabik mine now figures on forwarding about 130,000 tons more of ore this season, and will finish shipping about Nov. 15. This will make a total of 850,000 tons for the season, which is 400,000 less than early in the year it was expected to ship.

The Fred. M. Prescott Steam Pump Co., Milwaukee., reports the following among its recent shipments of pumping machinery: One triple expansion mine pumping engine to the Buffalo & Susquehanna Iron Co., Hibbing, Minn., and one triple expansion mine pumping engine to the Iroquois Iron Co., Hibbing, each with a capacity of 1,200 gallons per minute; part of a large order which includes two triple expansion pumping engines of large capacity to the El Oro Railway & Mining Co., Ltd., El Oro, Mex.; a deep mine triple expansion pumping engine to the Penn Iron Mining Co., Vulcan, Mich., with a capacity of 1,000 gallons per minute against 1,200 ft. head; a triple expansion high service pumping engine with a capacity of 1,500,000 gallons per day against 175 pounds water pressure to the New Castle, Pa., waterworks; a compound condensing mine pumping engine with a capacity of 500 gallons per minute against 1,200 ft. head to the Calumet & Arizona Mining Co., Bisbee, Arizona. Among recent orders, the company has booked the following: Vertical beam condenser for the Denver Tramway Power Co., Denver, Colo., with a capacity of 70,000 pounds of steam per hour; two triple expansion mine pumping engines for Mesabi iron range mines, each with a capacity of 2,000 gallons per minute; one triple expansion pumping engine for the East St. Louis, Ill., waterworks, with a capacity of 6 million U. S. gallons of water per day.

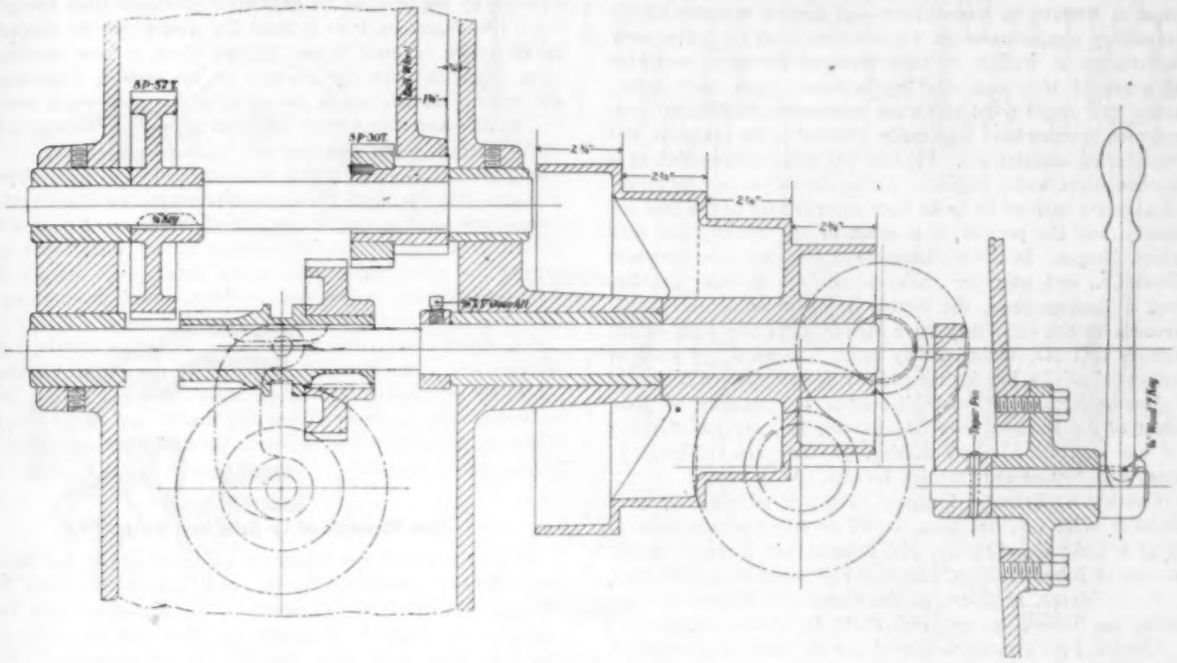


FIG. 3 —BACK GEAR MECHANISM.

The first steel was rolled at the Lackawanna Steel Co.'s plant at Buffalo, on Oct. 14. It is explained that the recent dismissal of 1,500 workmen marked the period of transition from the work of constructing mills to that of turning out products from the mills and that new employes will be added to the payroll, as iron and steel workers.

A COMPARISON OF 1903 WITH 1893.

The tremendous declines in the stock market since the opening of the year have caused a number of comparisons to be made during the last few months between the prices of 1903 and those of 1893. As far as the movement of the stock market is concerned there is, indeed, a close analogy between the two years. Since the opening of the year there has been a shrinkage in the stock market values estimated at considerably more than $2,000,000,000. This is unquestionably a greater shrinkage in security values than occurred in 1893, and it is not surprising that persons whose views are largely circumscribed by the movement of prices in Wall Street are beginning to make comparisons between 1903 and 1893.

Those whose economic views are based on broader grounds than simply the fluctuation of the stock market, however, know that there can be no possible comparison between the general conditions in 1893 and those in 1903. To mention only a few of the fundamental differences, one of the most striking that appear is in regard to failures. In the nine months to Oct. 1 of this year, according to Bradstreet's, the liabilities of firms that have been forced to admit insolvency aggregate $88,800,000. In the same period of 1893, according to the same authority, the total liabilities of the firms that failed were $327,200,000. In other words, the failures in 1893 were nearly four times the total of this year's.

These failures alone, without any attempt to go any further into the subject, show how ridiculous is the suggestion of making a comparison between the general industrial conditions of 1893 and those of 1903.

In 1893 gold was being hoarded and withdrawn from this country. Our credit abroad was practically destroyed, all Europe fearing that this country would repudiate its debts by going on a silver basis. The United States is now permanently on a gold basis and possesses the largest supply of gold of any country in the world. Our credit aboard is greater than ever before in the history of the country. In 1893 over 25 percent of the railroads of this country were in the hands of receivers, whereas the railroads are now enjoying the very greatest prosperity on record. In 1893 the South and the West were prostrated—heavily in debt and finding the greatest difficulty possible in "making both ends meet." As a result of the series of favorable cotton and grain crops during the last few years and the high prices that have been received for these crops, the South and the West are now enjoying the greatest prosperity of any sections of the country.

If Wall Street wants to find the real explanation of the tremendous decline in the stock market it will at once give up the effort to compare the general industrial conditions of 1903 with those of 1893. The cause of the recent shrinkage in security values can be found much nearer at home—in Wall Street's past excesses and in its reckless juggling with capital that has marked the last three years.—[New York Commercial.

PERSONAL.

Henry Wehrum, for years a prominent figure in the steel industry of the country, has resigned his position as general manager of the Lackawanna Steel Co., at Buffalo, N. Y. Mr. Wehrum is a self-made man, having started early in life at the bottom of the ladder, in what was one of the largest iron works in Alsace-Lorraine. Natural talent, combined with close application, soon enabled him to rise, and he developed decided ability in mechanical and metallurgical lines. He was an earnest advocate of the then new Bessemer steel process, which he closely watched through all its development. Shortly after the Franco-Prussian war he came to the United States, accepting a position with the old Lackawanna Iron & Coal Co., at Scranton, Pa. His merit soon won recognition, and he rose steadily, becoming chief engineer of the company, which position he held for some years. In 1881 he resigned to accept a call to construct the new works of the Scranton Steel Co., as chief engineer. When the Scranton Steel Co. consolidated with the Lackawanna Iron & Coal Co., forming the Lackawanna Iron & Steel Co., he was made chief engineer and general superintendent of the new company. He was appointed general manager in 1896. In all these years of active work he personally superintended all the various undertakings of this company. No detail was so insignificant as to escape his watchful eye. Besides being general manager of the large plant at Buffalo, he was director and general manager of the subsidiary companies of the Lackawanna Steel Co. The work undertaken at Buffalo in 1900 involved the most extensive program of iron and steel work construction ever undertaken at a single point and some noteworthy departures from common practice have been made. Added to his executive and engineering abilities Mr. Wehrum has large attainments as a mathematican and a linguist. An active and successful career of 44 years such as he looks back upon is rare in the iron industry, and the portion of it spent in this country has seen great changes. In the manufacture of steel rails the Scranton Steel Co., and later the Lackawanna Iron & Steel Co., has had a leading place, the Scranton rails having exceptional records in the tests they have stood. It is the wish of his friends that Mr. Wehrum may again take an active place in industrial affairs, but for the present he has planned to rest.

Jerome Keeley, Sr., of Philadelphia, has resigned as president of the Durham Iron Co., Easton, Pa., and has disposed of his interests. Jerome Keeley, Jr., has also resigned as superintendent of the Durham furnace.

Charles S. Roberts, formerly secretary of the American Steel & Wire Co., has been elected president of the Weaver Coal & Coke Co., Chicago. Mr. Roberts was formerly an associate of John W. Gates, who is one of the chief stockholders.

P. G. March, president of the Cincinnati Shaper Co., has sailed for Europe and will visit Paris, on a business trip.

Charles Fell, superintendent of the lap weld department of the McKeesport plant of the National Tube Co., McKeesport, Pa., has been appointed superintendent of the tube and pipe departments of the new mill at Lorain, O. Archie Duncan, night superintendent, succeeds Mr. Fell at the McKeesport plant.

George L. Reis, who was made vice president of the Lackawanna Steel Co. some months ago, has become also general manager on the resignation of Henry Wehrum. Mr. Reis comes of a well known family of blast furnace and steel works managers, and his first connection was with Shenango Valley furnaces and rolling mills. Later he was connected with Southern works and for several years past has been manager of the Bay View works of the Illinois Steel Co.

Edward W. Snowdon, formerly with the Southern Car & Foundry Co., is now connected with Thomas A. Mack & Co., of Cincinnati, as salesman.

M. C. Shannon, of Birmingham, has been appointed chief chemist of the Alabama Wire & Steel Co., with headquarters in Gadsden. Mr. Shannon has been an assistant chemist with the Tennessee Coal, Iron & Railroad Co., at Ensley, Ala.

Albert Scherzer, president of the Scherzer Rolling Lift Bridge Co., Chicago, returned this week from an extended business trip abroad. He visited the representatives of his company in Russia, Germany, Denmark, Holland, Belgium, France and Great Britain, and the contracts secured and the negotiations pending for bridges indicate that the use of this type of bridge will be extensive abroad. The Scherzer bridge under construction for the South Eastern & Chatham Railway Co. is rapidly nearing completion. Good progress is also being made upon the Scherzer rolling lift bridge across the Suir River, Ireland, for the Fishguard & Rosslare Railway Co.

Countervailing Duties on Canadian Bounty Steel.

(Special Correspondence.)

WASHINGTON, D. C., Oct. 19.—Complaint has been made to the Treasury Department concerning imports of steel into the United States from Canada. A domestic steel company which recently lost a contract for billets which was taken by the Dominion Iron & Steel Co., of Sydney, Cape Breton, N. S., called the attention of the department to the fact that the Dominion Iron & Steel Co.'s product was manufactured under a bounty and therefore should be assessed a countervailing duty on coming into this country. The Canadian bounty act of 1897 passed by the Dominion Parliament provides for the payment of $3 a ton on steel ingots manufactured from ingredients of which not less than 50 percent of the weight thereof consists of pig iron made in Canada; $3 per ton on pig iron on the proportion produced from Canadian ore and $2 a ton on pig iron on the proportion produced from foreign ore. The Dominion Iron & Steel Co. would thus be entitled to $6 a ton on steel billets, though there is now pending some litigation over the payment of the bounty, Dominion government officials taking the position that steel made from hot metal taken direct from the blast furnace is not entitled to the bounty on pig iron, but only to that on steel.

In any event the government aid extended to Canadian iron and steel manufacturers has been sufficient to take home trade away from steel works of the United States in the present instance and the Treasury Department is now called upon to impose the additional countervailing duty which the act of congress provides in the case of bounty-aided products exported to this country by foreign manufacturers.

The department is now investigating the whole matter, collecting facts as to dates of shipments of steel from Canada, quantities and consignees. There is of course no redress for shipments already received but the matter can be governed in future, if it is found to be one to which the law on countervailing duties applies.

New President of La Belle Iron Works.

At a meeting of the board of directors of the La Belle Iron Works, Steubenville, O., held last week, John E. Wright tendered his resignation as president and requested that John A. Topping, late first vice president of the American Sheet Steel Co., be elected to succeed him. The board also authorized the issue of $2,000,000 of 6 percent 10-20-year gold bonds to provide working capital for the company. The present capitalization of the company is $7,000,000. While it was stated no action was taken on Mr. Wright's resignation at the meeting at which it was presented, at a subsequent meeting it was accepted and Mr. Topping was elected his successor. The new president will take office on Oct. 22. Mr. Topping went abroad after his resignation from the American Sheet Steel Co. and recently returned to New York.

A New Record on All Mesabi Ore.

In the 24 hours between Sunday night, Oct. 18, and Monday night, Oct. 19, No. 2 furnace of the Clairton Steel Co., at Clairton, Pa., established a new 24-hour record, producing 630 tons. To make this iron 927 tons of Mesabi ore was used. This is an 85-foot stack and was designed to produce from 450 to 500 tons per day.

The Field-Evans Iron Co. on Oct. 15 succeeded J. K. Dimmick & Co., 801-802 Murtland Bldg., Pittsburg, and will handle all the brands of iron formerly sold through the Pittsburg office of J. K. Dimmick & Co., including the Sloss-Sheffield irons.

Open-Hearth Steel Making and Blast Furnace Gas in Gas Engines.*

BY PETER EYERMANN.

With the enormous development of the industries of the United States has been combined the development of all the necessary appliances for the production and transportation of large quantities of iron ore, coal, coke, lime, slag, pig iron, and Bessemer and open-hearth steel in all forms and sizes. At the same time all the marvelous installations of new railway equipment and the fleets of ocean and lake steamers have been growing, and inventions for the handling of material have astonished the world. The Brown ore handling plants and gigantic loading cranes, together with the famous system of the three-motor traveling cranes and the scientific Wellman charging machine, are wonderful results of a new mechanical science specially founded on electricity.

But in spite of all these installations, whose original object was labor saving, the cost of open-hearth steel was not cheapened enough to compete with Bessemer or Thomas blown steel. Yet, as is well known, open-hearth steel is used more than any other metallurgical product in the world's consumption.

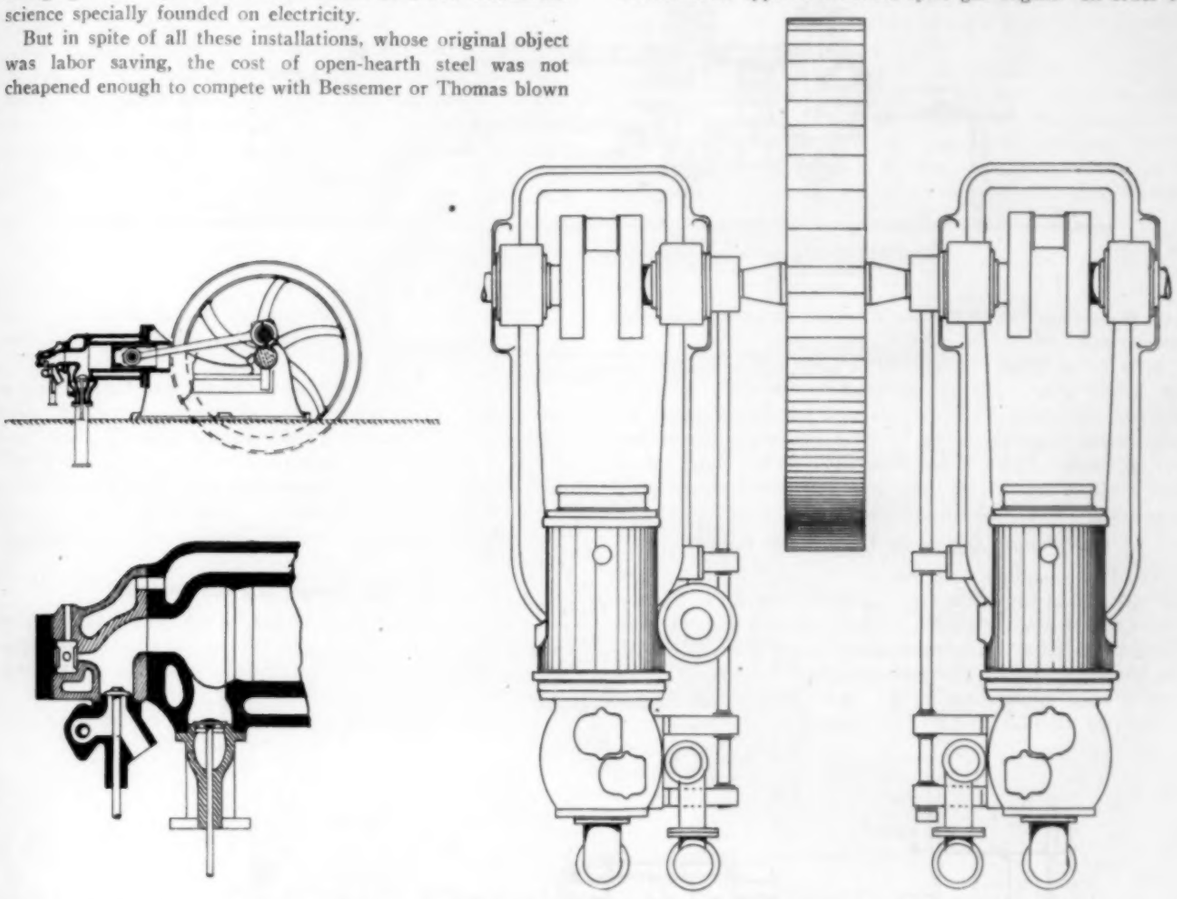


FIG. 1.—COCKERILL AND DEUTZ TYPES OF SINGLE-ACTING, FOUR-CYLINDER ENGINE.

In studying American and European practice it is found that the great question has always been how open-hearth steel could be produced at a less cost and in larger quantities. Whenever I have seen the long rows of open-hearth furnaces, especially in the Pittsburg district, my first thought was, "What would be done should scrap be scarce or the price too high?"

A most important development in Europe in the last few years is the operation of gas engines directly by blast furnace gas. So much has been published on this subject within the last few years that it seems a waste of time to dwell on the advantages of the blast furnace gas engine. There is, in my mind, no point which could not be solved. There are today four types of gas engines especially preferred for the use of blast furnace gas. Fig. 1 shows a sketch of the well known four-cycle single acting gas engine (Seraing and Deutz), which has, as a rule, the following dimensions, calculated from a large number of gas engines:

1. Stroke 3/8 inch per i. h. p. for 100 h. p. down to 5-64 inch for 800 h. p.
2. Circumference of cylinder 11-16 inch per i. h. p. for 100 h. p. down to 3-16 inch for 800 h. p.
3. Piston area 4 square inches per i. h. p. for 100 h. p. down to 2.65 square inches for 800 h. p.
4. Cylinder area equal to cylindrical surface and added to two piston areas, 25 square inches per i. h. p. for 100 h. p. down to 15.5 square inches for 800 h. p.
5. Cylinder volume (stroke × piston area) in cubic inches per i. h. p.—140 to 150 cubic inches for 100 h. p. down to 120 cubic inches for 800 h. p.

Figs. 2 and 3 are sketches of double-acting four-cycle engines. Too few engines of this class have been put in use thus far to enable us to make a definite statement of relative proportions as in the above case. Fig. 4 is a sketch of the Oechelhauser type of a double cycle gas engine. In order to get the right proportions on this it must be noted that the joint travel of the two pistons is equal to two diameters of the crank. The Oechelhauser has, as a rule, the following dimensions:

1. Stroke in inches per i. h. p.—7-32 inch for 200 h. p. down to 3-32 inch for 1,000 h. p.
2. Circumference of cylinder in inches per i. h. p.—¼ inch for 200 h. p. down to ⅛ inch for 1,000 h. p.
3. Piston area in square inches per i. h. p.—1 square inch for 200 h. p. to 1,000 h. p.
4. Cylinder area equal to cylindrical surface and added to two piston areas in square inches per i. h. p.—14 square inches for 200 to 1,000 h. p.
5. Cylinder volume (stroke × piston area) in cubic inches per i. h. p.—36 cubic inches for 200 to 1,000 h. p.

This system shows some advantages as compared with the first system.

Fig. 5 shows the well known Körting system as a double-acting two-cycle engine. The proportions as given below show some advantage in comparison with similar systems.

1. Stroke in inches per i. h. p.—5-64 inch for 500 h. p. down to 1-16 inch for 700 h. p.

*From a paper read before the Civil Engineers' Club of Cleveland, Sept. 22, 1903.

2. Circumference of cylinder in inches per i. h. p.—9-64 inch average for 600 h. p.

3. Piston area in square inches per i. h. p.—.92 square inch average for 600 h. p.

4. Cylinder area equal to cylindrical surface and added to two piston areas, in square inches per i. h. p.—7.7 square inches average for 600 h. p.

5. Cylinder volume (stroke × piston area) in cubic inches per i. h. p.—44 cubic inches average for 600 h. p.

I am working on a new gas engine and expect to reduce the above dimensions considerably, especially the cylinder area, which I expect to reduce down to about six square inches and the cylinder volume down to about 25 cubic inches per horsepower.

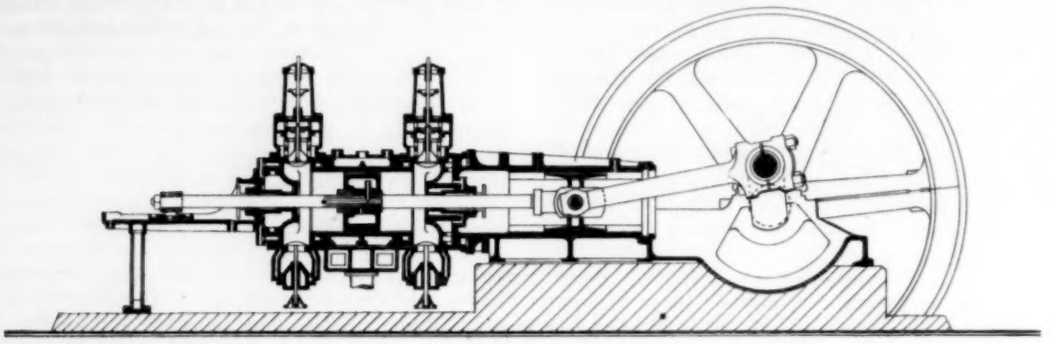


FIG. 2.—GAS ENGINE OF DEUTZ DESIGN. DOUBLE-ACTING, FOUR-CYCLE TYPE.

It is to be hoped that the most dangerous installation in all power plants, namely the steam boiler, will disappear entirely, not alone in the blast furnace but also with the improvements in gas producing, in other industrial and manufacturing plants. There is only a question of the right type of gas producer suitable for each quality of coal and producing a power gas free from tar and dust.

Blast Furnace Gas for the Open-Hearth Furnace.

I had the opportunity, on May 7 of last year, to read a paper on this subject before the Iron and Steel Institute in London. Since that time a patent, No. 723594, has been granted in the United States for an invention which relates to a new process for producing steel. The most important claims are on the use of blast furnace gas in the open-hearth furnace, either directly or enriched, in a special regenerating gas producer. I recently received a letter from one of the most important steel works in the United States, which is very interesting, and I think this would be a good place to make known the contents in order to show how different are the opinions in this direction. The letter is as follows:

"In looking over your patent I find that it relates principally to the process of producing open-hearth steel which consists in charging liquid pig iron directly from a blast furnace into an open-hearth furnace and heating this metal first by the combustion of poor blast furnace gases and finally by the combustion of blast furnace gases which have been enriched by passing them through incandescent coke or similar material.

"This process seems to me to be impracticable for various reasons, but it will be sufficient to call your attention to the fact that to produce one ton of open-hearth steel requires the consumption of at least 700 or 800 pounds of good gas coal. Our blast furnace having no gas to spare beyond that made for the heating of the blast and the production of steam, which latter has to be helped out by the use of a considerable quantity of steam coal; besides this, the character of the blast furnace gases is not such as to produce good effects in an open-hearth furnace. As our blast furnaces have no gas to spare to operate an open-hearth furnace, this alone is sufficient to dismiss the matter from further consideration."

The circumstances as described in this letter are the same in many steel works, and this suggested the new process. Why not save this wasted gas?

If there are needed 800 pounds or more coal for each ton of open-hearth steel, and if there are necessary besides, large quantities of steam coal for driving steam blowing engines—if this is not reason for improvement what reasons could there be? Influenced by such considerations I have devoted much attention to the study of modern blast furnace construction, not the metallurgical part but the structural and mechanical appliances.

The Blast Furnace as a Gas Producer.

In my opinion the blast furnace of the future will be more important as a producer of gas than of pig iron and therefore certain modifications may be introduced in order the better to fulfill the new requirements.

Without entering too closely into details, it may be of interest to refer here to a new form of charging appliance, consisting of a continuously working bucket elevator, which conveys the mixed charge and coke in smaller quantities than is usually the case, and tips it on to the bell. In this manner the distribution of the material in the furnace is the most uniform possible, and consequently a greater regularity in the giving off of gases is assured. As a precaution against the unnecessary waste of gas, the throat of the furnace is provided with a bell of the ordinary form, below which is suspended a vertical revolving tube. Within the latter is a screw which is also capable of independent rotation, down which the charge gradually slides into the furnace, and is thus distributed with

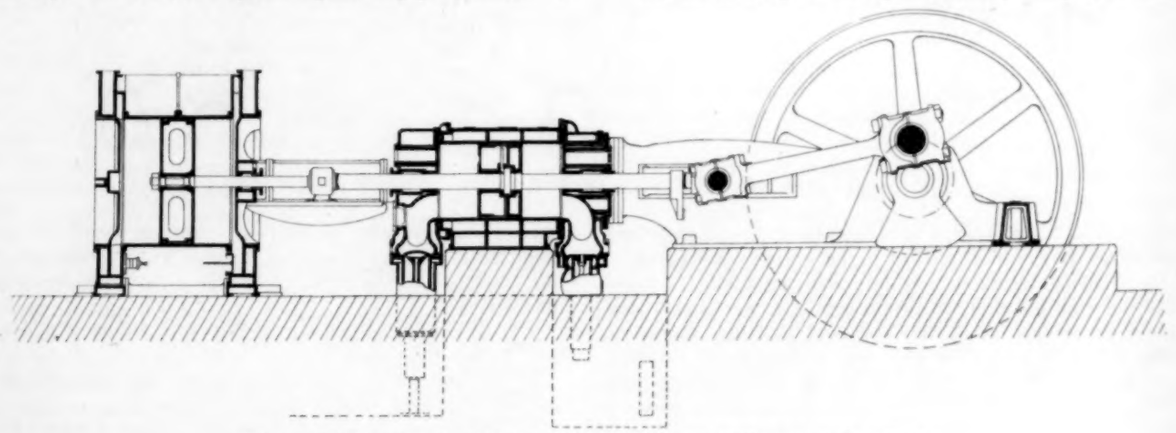


FIG. 3.—DOUBLE-ACTING, FOUR-CYCLE GAS ENGINE OF COCKERILL CO.'S DESIGN.

perfect evenness. The surface of the screw might be made adjustable in an axial direction, and the revolving motion so arranged as partially to compress the charge, thus forming a further preventive against the escape of gas. Outside on the top are fixed two cylinders in tandem fashion, filled with oil and fitted with plungers, which are suitably connected by means of levers to the bell. By this means the lowering and raising of the bell is effected automatically at certain intervals, the operation being aided only by the weight of the charge accumulated on the bell. This arrangement is an absolutely sure preventive of the escape of gas through the hopper. The drawing off of the gases takes place chiefly at the center of the furnace through a ring-shaped pipe, which entirely encircles the vertical charging tube, and as a precautionary measure against explosion safety valves opening outwards are fitted on the sloping surface of the conical shell forming the cover. Further, the main supporting frame of the furnace combines certain features of both German and American practice. In the author's opinion the American plan of the loose shell is a very excellent one, also the system of water-cooling which extends right through the brickwork to the bosh walls. As regards the tuyeres, the elliptical form of opening for the nozzle is perhaps the most suitable, since these have proved so efficient in the case of large cupolas. It has often come under the author's notice that the rings encircling the furnace bosh, a special feature of American construction, are liable to burst from the strain caused by excessive heating, and it might therefore be an improvement to shape them so as to form reservoirs for cooling water. The whole of the lower framework stands free, and is not walled in by masonry, a plan which is greatly to be preferred, since the chilling of the furnace hearth by the formation of "bears" cannot occur. The great waste of water in cooling the lower portions of the brickwork, which so frequently occurs in closed masonry and cannot be controlled, is at any rate avoided by this means.

In the following calculation an effort is made to show how it would be possible to reduce the consumption of coal for open-hearth steel, perhaps down to 200 pounds or less; and also, not alone to reduce the coal in the blast furnace plant for the boilers but to throw out these coal eaters completely and to win, besides, enough power to sell it in the form of electricity or use it in heating furnaces.

Economies of the "Compound Furnace."

I may say here that it would be very advantageous to have a central gas improving station combined with a central gas cleaning station; but time will not permit me to go into the details of this. The new furnace should be called "compound furnace" because it combines features of the Bessemer blowing process and those of the open-hearth process. The product may, therefore, be called "compound steel." The following calculation is based on practically known items and is a continuation of the theoretical calculation of Mr. Toldt read before the Iron and Steel Institute. It will only be a rough sketch showing what an important plant a blast furnace is and it will only be suggestive of the interesting questions involved.

1. The first point is that this combined blast furnace and steel plant is using entirely modern gas engines; a boiler house does not exist any more and the necessary gas producers, including the blast furnace, are supplied with not only good coke, but all kinds of coke, and if possible some kinds of coal. The mixer, the long rows of open hearths and the separate blowing engine house are completely dispensed with. Instead of high priced scrap, more and cheaper high grade iron ores, and metal directly poured from the blast furnace, will be used. If there is a blast furnace of 500 tons daily capacity, or rather two furnaces of 250 tons each, if there are not other furnaces in the neighborhood, an average of 500 tons of coke for the production of these 500 tons of pig iron is used.

500 divided by 24=21 tons of pig iron per hr.

2. One ton of coke charged into the blast furnace is equal to 4,600 cubic meters of gas. This was carefully measured and calculated for the European coke, but for the better American coke we can include a little more gas, because it is intended to charge more coal and coke into the blast furnace than would be necessary to produce pig iron alone. In this case the pig iron producer must also be a gas producer.

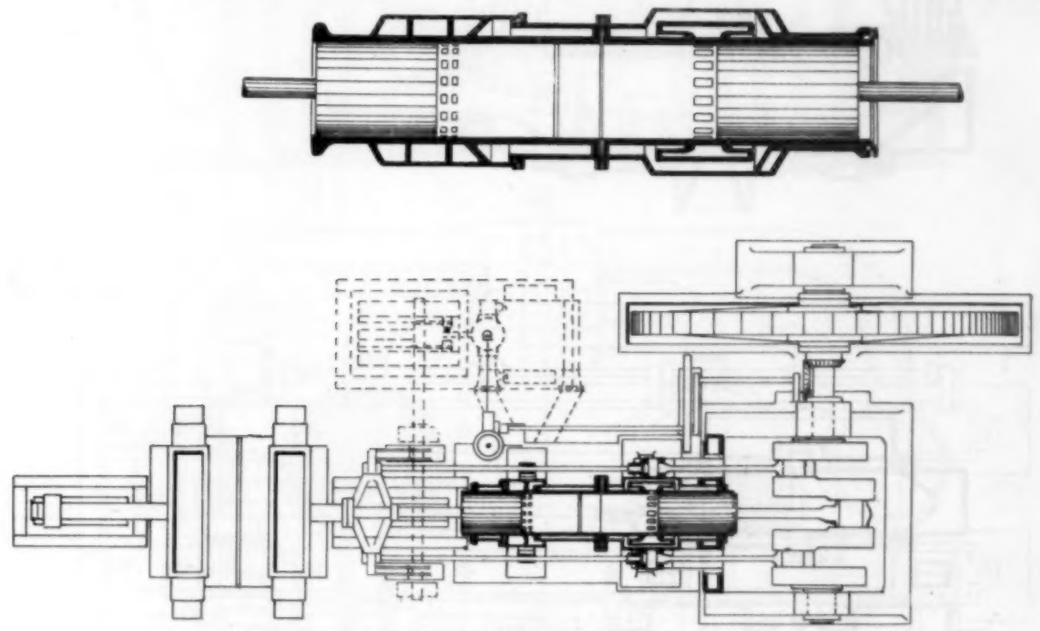


FIG. 4.—TWIN-PISTON, TWO-CYCLE GAS ENGINE OF OECHELHAUSER TYPE.

A paper from Mr. Uehling was received while making this calculation, wherein he puts the quantity of gas for each ton of pig iron at about 10,600 pounds. It can therefore be seen that it will not be very far from a large average to base the following calculation on 5,000 cubic meters of blast furnace gas produced from each ton of coke charged. This is equal to 175,000 cubic feet of gas per hour. 500 tons × 5,000 meters = 2,500,000 cubic meters of gas per day. 2,500,000 divided by 24=105,000 cubic meters of gas per hour or 3,575,000 cubic feet of gas. The same result is obtained by multiplying 21 tons by 5,000 cubic meters which equals 105,000 cubic meters of gas per hour.

This quantity of gas is free for use on any kind of work or for selling, but the most important use will be:

3. For burning the coke in the blast furnace there is blown in by the blowing engines for each kilogram of coke, six cubic meters of air per hour; therefore for 21,000 kilograms of coke, are necessary 21,000×126,000 cubic meters of air per hour, or 2,100 cubic meters of air per minute. By experience it is known that nearly 1.3 h. p. per cubic meter of pressed air is necessary. This may be increased to 1.5 h. p. for modern plants. 2,100×1.5=3,150 h. p. per hour. For one h. p. per

hour is required, in a new gas furnace, only three cubic meters of gas, or 3 divided by 60=.05 cubic meter of gas per minute which is equal to 105 cubic feet of gas per hour. 3,150 h. p. × .05 cubic meter=157.5 cubic meters of gas per minute. 157.5× 60=9,450 cubic meters of gas per hour, which is equal to 330,750 cubic feet of gas per hour. The above will be named "blowing engine gas."

4. By careful measuring we find that in existing plants nearly 10% loss of blast furnace gas may occur. The loss will be in the pipes at the top, in the dust catcher, by charging ore and coke during the lifting of the bell, etc.; therefore, the next important point will be 10,500 cubic meters of gas per hour equals 367,500 cubic feet of gas per hour. The above will be called "furnace loss gas."

5. It would be advisable, not only in new blast furnace plants, but also in old plants, to clean all the gas in one central cleaning station. It is known that for each cubic meter of gas to be cleaned, there are necessary .01 to .025 h. p. per hour, or for each thousand cubic feet of gas .3 up to .75 h. p. per hour. 1 h. p. needs 3 cubic meters or 105 cubic feet of gas per hour, therefore, 105,000×.02=2,100 h. p. per hour, or 2,100×6,300 cubic meters of gas per hour, or 220,500 cubic feet. The above is named "cleaning engine gas."

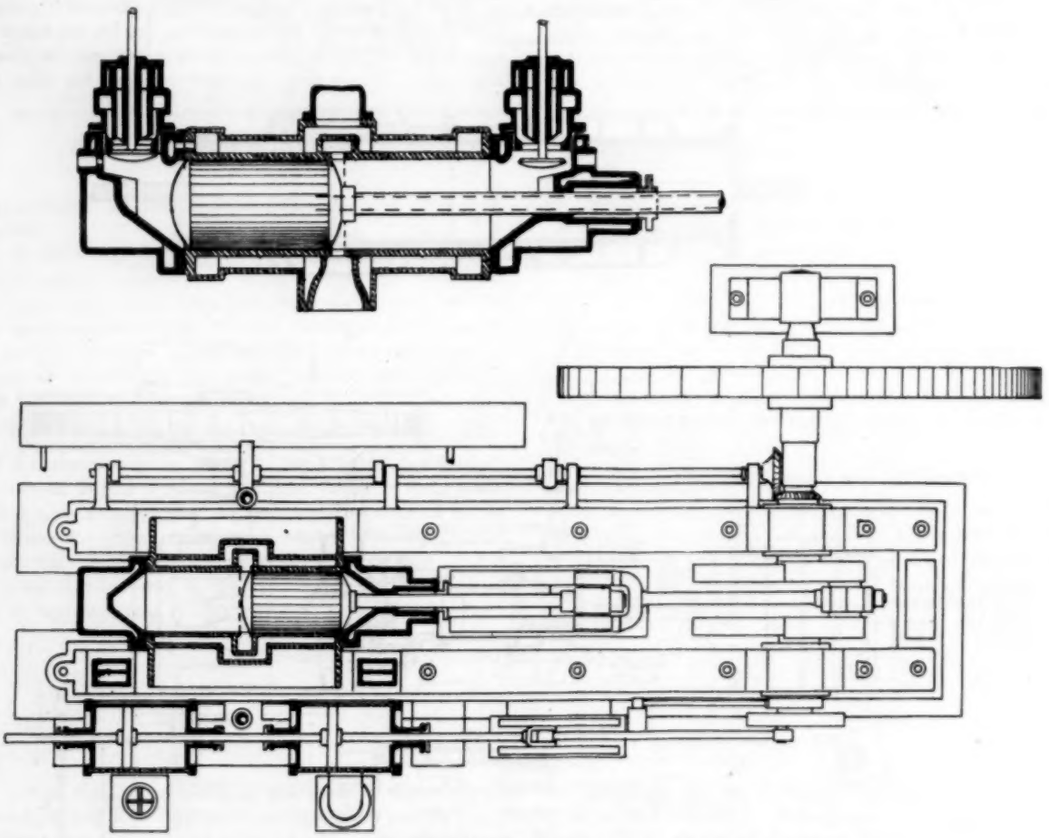


FIG. 5.—KÖRTING TYPE OF DOUBLE-ACTING, TWO-CYCLE GAS ENGINE.

6. It is certainly to be expected that not more than 25% of the gas will be used for heating the air in the stoves, if all is cleaned. In earlier years this percent was much greater, but with the cleaned gas there can surely be obtained 105,000 ×.25=26,250 cubic meters of gas per hour, or 818,750 cubic feet. The above will be called the "blast heating gas."

7. It is important to observe that this combined steel and blast furnace plant needs, under modern conditions, 100 up to 120 h. p. for each 100 ton daily capacity for the electric generating plant. This electricity will be used for all electric handling machinery and for electric illumination. For 500 tons a day is needed 120×5=600 h. p. Each h. p. consumes 3 cubic meters of gas per hour or 105 cubic feet, therefore, 600×.3= 1,800 cubic meters of gas per hour, or 63,000 cubic feet. The above will be named "electric generating gas."

8. Directly in combination with the blast furnace plant should be the compound steel furnace. In an open-hearth furnace of the general style the average for each ton of steel is 300 kilograms of good coal or nearly 675 lbs. per ton. These 675 lbs. are specially needed where many steel ingots are poured. This quantity of coal is equal to 1,500 cubic meters of producer gas. There are 21 tons of pig iron to convert into steel each hour. For this process is used 21×1,500=31,500 cubic meters producer gas. The difference of units between the producer gas and the gas from the blast furnace is only 100 up to 200 calories per cubic meter or 10 to 20 B. T. U. per cubic foot. It will therefore, be sufficient for this rough calculation to accept this number also for the compound furnace, as it is intended to work only ¼ or ⅓ of the whole heating time with blast furnace gas directly. During other parts of the heating time coke gas will be used from the attached producer, mixed with improved blast furnace gas. The latter is better than any producer gas, because it has up to 1,500 calories per cubic meter or 170 B. T. U. per cubic foot, Therefore, 31,500×⅔=21,000 cubic meters, or 735,000 cubic feet of gas used in the compound furnace. The above may be called "compound steel gas."

9. One of the most important ideas in this patent is the use of the blast of the blast furnace directly in the open-hearth furnace. With this air the first rough fining of the metal should be done; therefore, a certain h. p. is more necessary for driving blowing engines than is necessary for the blast furnace plant alone. This refining blast can be taken directly from the main pipe, hot or cold. Finishing for example 20 tons of steel in a general Bessemer or Thomas plant, there are needed nearly 1,000 up to 1,200 meters of air. If only a rough fining is necessary, as in this patent, it will probably not be wrong to say 300 up to 500 cubic meters for these 20 tons or 15 to 25 cubic meters for one ton of steel.

Taking 25 and figuring 21 tons per hour to the fining, this will be: 21×25=525 cubic meters of blast. For each cubic meter is necessary 1½ h. p. per hour if the same pressure as above stated is sufficient. Each h. p. needs again 3 cubic meters of gas in the gas engine. Therefore, 525×31.5=1,575× 1.5=2,362 cubic meters, or 82,690 cubic feet of gas. The above will be named "fining blast gas."

10. In paragraph No. 8 we had 31,500 cubic meters of gas. Of this only 21,000 have been used directly in the furnace, there remaining 10,500 cubic meters for improving purposes;

but it is possible that only 6,000 cubic meters are needed for regenerating in the coke stoves. Some blast furnace gas can also be used for heating the ladles for burning fire proof materials, besides some loss which will occur in the valves, dampers and pipes. Together with the 6,000 cubic meters can be calculated here, 10,500 cubic meters or 367,500 cubic feet of gas per hour. The above will be named "steel loss gas."

11. To complete this outline of the modern steel plant, it is important to state that there are some other methods of converting by-product in money: (a) The use of the coke oven gas, in the common way or also in the compound steel plant. (b) The manufacturing of bricks from the blast furnace slag. (c) The installation of a burning and milling factory for Portland cement.

It is impossible to go into these observations thoroughly,

(3) Blowing engine gas ..... 9450 cu. meters or 330750 cu. ft.
(4) Furnace loss gas..... 10500 cu. meters or 367500 cu. ft.
(5) Cleaning engine gas ..... 6300 cu. meters or 220500 cu. ft.
(6) Blast heating gas ..... 26250 cu. meters or 918750 cu. ft.
(7) Electric generating gas ... 1800 cu. meters or 63000 cu. ft.
(8) Compound steel gas ..... 21000 cu. meters or 735000 cu. ft.
(9) Fining blast gas ..... 2362 cu. meters or 82610 cu. ft.
(10) Steel loss gas ..... 10500 cu. meters or 367500 cu. ft.
per hour 88162 cu. meters or 3085610 cu. feet.

14. The blast furnace has 105,000 cubic meters or 3,673,000 cubic feet of gas free to sell per hour, less 88162 cubic meters, or 3,085,690 cubic feet of gas, equals 16,838 cubic meters or 589,310 cubic feet per hour.

15. The best way to sell power today is in the form of electric current. It can be obtained directly from gas engines. Each h. p. needs 3 cubic meters or 105 cubic feet of gas per

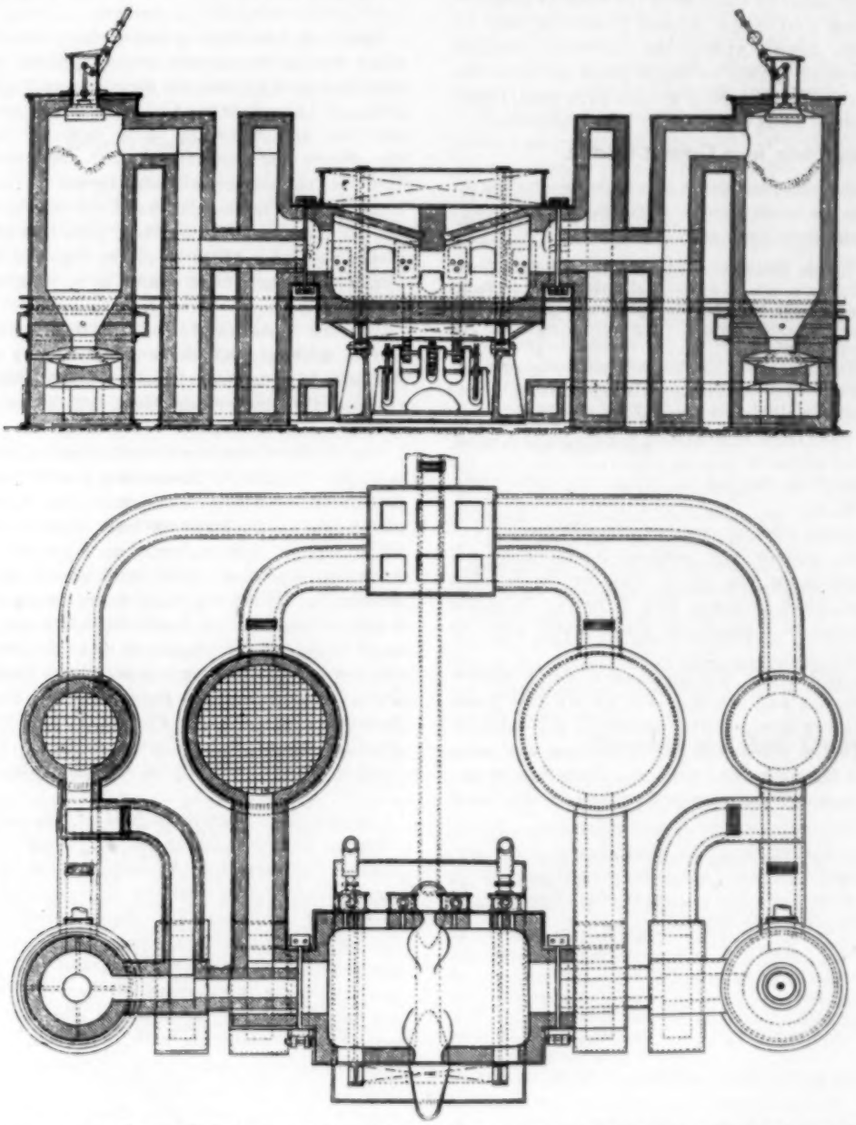


FIG. 6.—COMPOUND FURNACE HEATED BY BLAST FURNACE GAS WITH ARRANGEMENT FOR FIRING BY THE AIR BLAST.

here, but we can estimate on the average of $1 to $2 per ton of pig iron according to circumstances.

12. The future of such a steel plant does not depend upon a certain quality of iron ore as with the Bessemer plants of today. If no high grade silicon pig iron is to be obtained then high phosphorus iron is also convenient. All grades of pig iron and ore can be used directly in this "compound furnace plant" and scrap only when it is very cheap. The local conditions may be such also that it may be possible to get basic slag. This by-product can be sold as a fertilizer. The amount saved would be 50c up to $1 per ton of steel.

13. The following table gives a clear idea of the different uses of gas per hour. Paragraphs 11 and 12 may be disregarded as they give only the practical results which have no influence on the following gas calculation:

hour. 16,838 divided by 3=5,600 h. p. As compared with electricity which is produced from coal in steam engines it certainly will not be too high to sell this furnace electricity for lighting purposes at 2c each kilowatt or 5,600×0.746=4,170 kilowatts. Now, assuming that in practical use only one-half of this power could be obtained, then $\frac{4170 \times 2}{2}$=4170 cents or $41.70 per hour.

In each hour are produced 21 tons of steel, therefore there is a profit on one ton of steel of nearly $2 by selling electricity.

16. From the viewpoint of the superintendent of the blast furnace plant, he would not give his gas to the steel plant for nothing. As seen above each cubic meter of gas is worth 0.25c if sold in the form of electricity. The steel plant needs

(as in 8, 9 and 10 above) 21,000 plus 10,500 plus 2,362=33,862 cubic meters of gas per hour. It would probably only be possible under extraordinary circumstances to sell this gas at the same price as electric light, therefore it would sometimes be better to sell it in large quantities in the form of electric power directly; in this case only 1.5c per kilowatt can be obtained. This would be another theoretical profit of 33,800 divided by 3=11,200 h. p. or 8,400 kilowatts. 8,400×1=8,400 cents, or divided by 21 tons=$4 per ton of pig iron. Now again taking for a practical figure only half of this result, there will be a profit of $2 per ton of pig iron.

17. The blast furnace plant can sell the above gas cheaper if no electric generating engines are necessary; if sold as gas it is to be noted that the heat efficiency of the blast furnace is lower than that of the producer gas. It is stated above that one cubic meter of gas sold in the form of power is worth .25c, but when sold as gas directly I will say only .1c up to .125c per cubic meter. 33,862 cubic meters or 1,185,190 cubic feet give therefore $33.862 or $42.50 profit per hour for the blast furnace. The production is 21 tons each hour, therefore there is a profit of $1.60 up to $2 per ton of pig iron.

A Comparison from German Practice.

18. Before closing this calculation it will be interesting to have a comparison of costs for a European 15-ton open-hearth furnace using good German coal:

(a) Coal for gas in the producers including small quantities of steam coal	480 pfenninge or	$1.20
(b) Loss of combustion of the hearth	500 pfenninge or	$1.25
(c) Fire brick, limestone, dolomite	200 pfenninge or	.50
(d) Repairing cranes, etc.	80 pfenninge or	.20
(e) Molds, bottom plates	180 pfenninge or	.45
(f) Fluxes and special iron	40 pfenninge or	.10
(g) Wear of the installation	300 pfenninge or	.75
(h) Salaries	440 pfenninge or	1.10
Total	2220 pfenninge or	$5.55

The cost of converting one ton of charges in open-hearth steel is therefore $5.55.

19. The approximate cost of one ton of steel ingots in a furnace of 200 tons capacity and working continuously will be only 1,300 pfenninge or less (as it was read in London before the Iron and Steel Institute, May 7, 1902). It would probably be interesting to compare the above points with the calculation below.

Here it must be said that it was proposed to use a 200-ton furnace some years ago, and before it was known that Jones & Laughlin of Pittsburg would erect a furnace of this capacity. It is clear in the English patent that the proposition was made to combine the new Talbot process with this blast furnace gas process. It is to be hoped that such a combination may have good results.

(a) Coke and coal for improving blast furnace gas and producing coke gas	160 pfenninge or	$ .40
(b) Loss of the hearth	320 pfenninge or	.80
(c) Fire brick, lime, dolomite, magnesite	140 pfenninge or	.35
(d) Repairs	60 pfenninge or	.15
(e) Molds, bottom plates	160 pfenninge or	.30
(f) Fluxes and special iron	80 pfenninge or	.30
(g) Wear of the installation	200 pfenninge or	.50
(h) Salaries	100 pfenninge or	.25
Total	1220 pfenninge or	$3.05

per ton. The difference is 1,000 pfenninge or $2.50 per ton of converted steel.

The iron ore which will be charged is calculated here with the charge and not in the way Mr. Talbot is accustomed to.

Referring to "b" and "e" both can be reduced under certain circumstances.

The above costs of producing one ton of steel would be astonishingly low and still lower if a basic fertilizer slag could be obtained.

20. The cost would be very low for one ton of pig iron produced from a modern blast furnace plant, situated in the neighborhood of a large city, which can sell all its power in electricity and which is equipped only with gas engines. The addition of the figures in paragraphs 15 and 16 give the result that there would be a profit of $4 on each ton of pig iron, but under certain conditions there may be only $2 profit therein. This profit can be nearly guaranteed today wherever an old-fashioned blast furnace and steel plant would be remodeled for this purpose.

21. The cost for one ton of "compound steel" would be:

(a) Gas of the blast furnace	$1.60
(b) Converting cost	3.05
Total	$4.65

To the above is to be added the cost of one ton of the charge (including the pig iron) and as seen this is very low. Excluding case 20, but referring to paragraphs 11, 12 and 15, it is certainly possible to get pig iron for $2 to $4 less per ton than the cost today.

This calculation is a proof that open-hearth or compound steel can be produced under good conditions just as cheaply as pig iron today or still cheaper in connection with the modern gas engine.

CONSOLIDATED LAKE SUPERIOR SALE POSTPONED.

Speyer & Co., have granted the extension of sixty days, asked for by the reorganization interests, of the sale of the securities held by them for their loan of $5,050,000 to the Consolidated Lake Superior Co. The sale is now fixed for Tuesday, Dec. 15. According to the terms of the compromise, all the officers and directors of both the underlying companies and the holding corporation agreed to retire, their places to be filled by representatives of the Speyers and the reorganization interests. In addition, actual possession of all the plants and other property of the Superior Company, both in Canada and the United States, is to be given to the Speyers immediately.

The first move toward the fulfillment of the company's part in this agreement was made at the meeting of the directors of the subsidiary companies, held in their offices in Philadelphia, Oct. 16, when their resignations and that of their officers were tendered and accepted.

The Moffly Committee's reorganization plan as revised provides for a capital of $40,000,000, and mortgage bond issue of $10,000,000, of which a little more than $7,000,000 will be put out to take up the $5,050,000 loan. These bonds will be issued at 70 percent, with a bonus of 3 percent in stock. Nearly $3,000,000 mortgage bonds will remain in the treasury for future use. There is also provision for the issuance of income bonds to the extent of $3,000,000, which are to be given at par to all who pay their assessment up to the amount paid in. The directors of the holding company, who resigned Oct. 19, are: Cornelius Shields, E. J. Berwind, T. C. Search, Samuel Rea, James S. Swartz, S. M. Prevost, F. H. Clergue, Lynde Harrison, H. K. McHarg, Charles E. Orvis, Charles H. Tweed, Gordon Abbott, H. G. Lloyd, George Philler and Charles MacDonald.

After a short conference held at Toronto last week, F. H. Clergue, accompanied by E. V. Douglas, handed over to Senator Dandurand, of Montreal, all the Lake Superior documents which, it is claimed, are necessary for closing the sale of all the Sault Ste. Marie industries to the Vickers-Maxim Co., of Sheffield, Eng., and the Armstrongs of Newcastle-on-Tyne. Senator Dandurand has had in charge for some time the negotiations of these British capitalists, who are said to desire to purchase the works. The purchase price is $8,000,000 cash, with subsequent payments until $30,000,000 has been paid. Senator Dandurand will sail for England soon to lay the details before his English clients. He expects that they will ratify them.

The Reese-Hammond Fire Brick Co., Bolivar, Pa., in announcing its receivership, says that it has assets largely in excess of liabilities, that its individual stockholders have made assignments for the benefit of its creditors and that all property has been turned over without preference. The works are all in operation, and there are large contracts on hand. The company expects eventually to pay all obligations in full.

The Ideal Machine Co., which was established in Hartford, Conn., three years ago, is to be moved to Portland, Me. The company owns a number of valuable patents on machine tools. The officers of the concern are: Charles L. Jarvis, president; William H. Edwards, of Portland, secretary and treasurer; Arden S. Pollard, of Portland, superintendent.

Improvements and Depreciation in Mine Accounts.

At the August meeting of the Lake Superior Mining Institute, W. M. Jeffery, auditor of the Oliver Iron Mining Co., Duluth, read a paper on "Mine Accounting." That part of the paper relating to depreciation, improvements and reserve account aroused a very interesting discussion. Mr. Jeffrey's paper, however, was read at a late hour at night at the Ishpeming meeting and he stated that, instead of detaining the members, he would prepare a supplemental paper for publication in the official report. This paper has been written within a few days and is herewith published. J. Parke Channing, of New York, and Prof. F. W. Sperr, of the Michigan College of Mines at Houghton, dissented from the views of Mr. Jeffery and, in the following papers, have revised and enlarged upon the brief remarks made at the Ishpeming meeting. In his original paper, Mr. Jeffery said on the subject referred to:

Mr. Jeffery's Position.

"New construction account is one to which would be charged the cost of buildings, structures or additions to the plant, such as new offices, shops, pumping plants, engine houses, shaft houses, etc., including all additions to the plant which would increase the value of such plant and are entirely new.

"Improvement account is one to which is charged such expenditures as rebuilding, remodeling, substitution of new machinery and equipment for worn-out or obsolete and kindred outlays for the improvement of existing works and facilities. It is quite probable that when improvements, as noted, are made, the new work would be on a larger scale than that supplanted. Possibly the cost might exceed that of the original, still in the line of conservatism, it would seem best to take care of such improvements through profit and loss account. Cases might arise, however, where the improvements would be so extensive or of such nature that in all fairness, plant account should bear a portion of the expenses. In such cases it would be proper to distribute a part of the cost. Each improvement should receive special consideration in this particular, by the proper officials of the company. The charges to the accounts mentioned above, are made from the mine records, in accordance, however, with instructions from the general office. I do not want to make this paper too long, and, therefore, will not go further into this at this time. I will gladly follow it up with supplementary information to any one who cares to have me take it up further. Such supplementary information would cover method of handling the accounts to keep track of each item of new construction or improvement separately, the handling of appropriation blanks which should be furnished to cover the cost of such new construction or improvement, as well as give a forecast of the work to be done and the nature of the same and the final disposition and closing out of the accounts.

"Innumerable points of detail might be brought up covering methods of handling reports, etc., in connection with the shipping of ore, keeping records of the same, making reports of production, balances in stock, royalty reports and other matters of this kind; also methods of making due-bills, manner of settling pay rolls and other matters of this kind. But these things depend so much on the requirements of the general office and the conditions at the mines, that I have thought best not to take them up, and will only touch briefly on a point which, while the mine offices are only interested to the extent of furnishing figures on which to base calculations, is still of considerable interest and of great importance; that is, the matter of depreciation.

"Depreciation may be defined as the actual loss upon assets which are diminishing in value, or it is an estimated sum charged against gross revenue, which amount should be sufficient to replace the capital used up or reduced by wear and tear. The loss or gain of an undertaking for any period, is not simply the difference between the receipts and expenditures during that period, nor is the current value of a plant always the amount which has been paid for or expended upon it. In accordance, therefore, with the best rules of business practice, a mining company, in order to insure its right to live, should provide from the current earnings a fund sufficient to cover all cost of property by the time its ore reserve is depleted. A rate per ton of depreciation is therefore arrived at on the basis of the best estimate obtainable of the ore reserve and the total cost of the property, including improvements. As often advices are received which affect the ore reserve in the property; that is, if the estimates prove to have been too high or too low as the work advances, and the ore body is better shown up, the rate of depreciation should be changed to fit the new condition, and the figures should be kept up so that by the time the ore reserve is exhausted, all of the investment will have been taken care of through the costs.

"I should like to take up detail cost sheets and labor sheets and other things which are of peculiar interest and great value to the operating department. I may have an opportunity to do this at some future time. Before closing, I wish to present a thought which may be worthy of consideration. It is to the effect that the accountants of the Lake Superior iron mines get together, and form an institute or association of mine accountants. Every accountant and bookkeeper has ideas peculiarly his own, and very often these ideas would be very valuable to others. If also frequently happens that clerks who occupy inferior positions, either because they have been in the employ of a company for a short time, or because they have been unable to show just what they can do, hold some of the very best and newest thoughts with regard to the work. If an organization of the kind suggested were formed, a general exchange of ideas could be given. Those receiving the ideas would benefit through the new ideas which would be presented to them; those expressing the ideas would be benefited through the prominence such expression would give them, and they would be brought to the notice of their superiors as in no other way. I think the formation of such an institute is a matter worthy of consideration, and that it would surely result in benefit to all concerned."

Comments of J. Parke Channing.

Mr. Channing's discussion as revised is as follows:

"I am particularly interested in that part of Mr. Jeffery's paper referring to depreciation and reserve account. This is a matter which is now receiving marked attention in discussing the finances of the Rand gold mines. I must, however, take issue with him in his contention that a certain sum should be set aside yearly from the profits and held for the purpose of paying back the original investment when the mine is exhausted. I am of the opinion that this money should be paid out to the shareholders year by year as it is made, as part of the regular dividend.

"A mining proposition is in its very nature different from a manufacturing industry and its final doom is exhaustion, at which time its plant becomes but mere scrap iron, its shafts but holes in the ground, and its stock certificates but gaudy pictures. Every mining man knows this, and therefore he expects a larger yearly return than if he invested his money in mortgages or manufacturing. The quicker we can exhaust a mine, the better for the investor, as he has his capital and his profit back the sooner for other investment. Why, therefore, should we as a mining company constitute ourselves a trust company and hold back from the investor his capital, giving him but his interest? I am aware that the smaller investor often fails to differentiate between return of capital and payment of profit and imagines that his dividends are all profits. I have in view a certain mining stock whose shares sell at a figure only equal to the probable annual dividends multiplied by the number of years the mine will probably last. In other words, the investor at the

present price will just get his money back after a term of years and lose all interest on it.

"It has been suggested and perhaps with propriety, that in declaring dividends it might be stated that so and so much was capital returned and so and so much was profit. The trouble is that the market value of a good mining stock is often far in excess of its original flotation value. Calumet & Hecla is selling at $450 per share. Its par is $25 and every year it is paying at least $25 per share in dividends. Would Mr. Jeffery have its board of directors set aside a sum to repay the $25 per share, or the market capitalized value of $450 per share, over which value the board have no control? The Utah Consolidated Mining Co.'s stock is selling at $28 per share and paying dividends at the rate of $3 per year. Its par is $5 per share and it was originally floated in London at 7 shillings or $1.75 per share. It has in reality more than paid back its original investment, and the present holder, if not one of the original investors, must take into consideration the future life of the mine in considering the value of his stock and his net return. The point I make is that the stockholder is the best one to amortize his capital and that it should be left to him to fix it as he thinks best.

"In my criticism of Mr. Jeffery's proposition to set aside a certain sum to repay the original investment in the mining property, I do not wish to be considered as objecting to the carrying of a proper or even a large reserve to provide for new or improved plant, the replacement of antiquated reduction works or the exploration for and development of new ore bodies. On the contrary, I believe that a careful board of directors will always have in view the fact that methods are improving and that mines are getting deeper and needing new plants, and they will be prepared for these eventualities by a good reserve. What I do contend for, however, is that any sum in excess of this should be paid out in dividends and none of it set aside to act as a reserve fund to repay the original investment at the end of the operation. In other words, the mining investor knows or should know that his return of capital and his profit comes from an exhaustion of his mine, from the turning of an inert mass into something useful to man and the quicker it is done the better. If he can invest his money in mines and make say 6 percent net, why should it be held for him invested in consols or government bonds returning him only 3 percent?

"A manufacturing concern owning its supply of raw material in the way of iron ore or coal is in a somewhat different position from a mining company pure and simple, in that its manufacturing plants probably represent the bulk of its capital. A concern of this kind is eminently justified in setting aside yearly a sum which in time will amount to its original investment in the mines. Inasmuch, however, as the value of the manufacturing plant probably depends in a large degree upon an assured supply of raw material, ordinary prudence would suggest the reinvestment of this money in other mining properties so that the manufacturing plant could never be at the mercy of outside owners of the raw material. The reinvestment of this reserve in new or extended manufacturing plant cannot in any way be justified any more than the return of it as dividends to the stockholders."

Prof. Sperr on Depreciation.

Prof. Sperr's views are embodied in the following statement:

"After a mine has entered upon what may be called the operating period of its existence, we will assume in order to simplify the argument that the difference between its operating expenses and the value of its product is uniformly the same from month to month and from year to year until the mine is exhausted. And because of the constant depreciation in the value of every mine from the exhaustion of the ore, this difference does not represent actual profit in the business. There is then a certain sum for depreciation which may not in reality be set aside for the redemption of capital, but which must be taken into account by the investor if he wishes to calculate correctly the probable profits upon his investments in enterprises having a limited period of life. Now, it seems to me reasonable that such a sum should be charged (I will not say set aside) each month so that the several sums at simple interest for the balance of each year and at compound interest for the remainder of the period of life, should equal the accumulated value of the capital at compound interest for the whole period, and allowing such rate of interest as money is worth without risk. Then if the monthly charge for depreciation is subtracted from the difference between the cost of operating and the value of the product, what remains will be the actual profit per month in the business.

"The above considerations are highly important to the investor, but it does not seem that they should have any part in the scheme of mine accounting. On the other hand, however, every obligation, like a bonded indebtedness which may become due at some future date, should be provided for by setting a certain sum at regular intervals during the period upon which the obligation rests. In the same manner every unusual expenditure for future benefit, like the sinking of a new shaft, the installation of a new hoisting engine or compressor plant, should be paid for out of the working capital. The working capital should be sufficient to meet all such extraordinary demands; and after every such depletion it should be restored by setting aside a fixed charge at regular intervals during the period which is calculated to be benefited by the improvement.

"The formula by which the periodical charges may be computed is derived as follows:

P = amount of capital required for redemption fund or for equipment and development fund.

m = number of years, including construction period, and redemption period or recovery period.

n = number of years beyond construction period.

y = rate of interest allowed.

C = the amount charged each month.

Then $C\left\{1+\frac{11y}{12}\right\}$ = the value of the first month's charges at the end of the year.

$C\left\{1+\frac{10y}{12}\right\}$ = the value of the second month's charges at the end of the year.

etc.

etc.

C = the value of the last month's charges at the end of the year.

The sum of this arithmetical series is $6C\left\{2+\frac{11y}{12}\right\}$ and represents the value of the several monthly charges at the end of each year.

Therefore, $6C\left\{2+\frac{11y}{12}\right\}(1+y)^{n-1}$ = the value of the first year's charges at the end of the business period.

$6C\left\{2+\frac{11y}{12}\right\}(1+y)^{n-2}$ = the value of the second year's charges at the end of the period and so on for each year until

$6C\left\{2+\frac{11y}{12}\right\}$ = the value of the last year's charges at the end.

The sum of this geometrical series is the value of all the charges for "depreciation," at the close of the business.

Then $\frac{6C}{y\ldots}\left\{2+\frac{11y}{12}\right\}\left\{(1+y^n-1\right\}=P\left\{1+y\right\}^m$ whence

$$C=\frac{Py(1+y)^m}{\left\{2+\frac{11y}{12}\right\}\left\{(1+y)^n-1\right\}}$$

Mr. Jeffery's Supplemental Paper.

"In my paper I defined depreciation as the actual loss upon assets which are diminishing in value, or is an esti-

mated sum charged against gross revenue (or operating, as may seem best), which amount is considered sufficient to replace the capital used up or reduced by wear and tear. In other words, it is the cost of raw material which should be added to the cost of producing such raw material or finished product, and may be applied later, either to purchase property to replace depletion, or paid to the stockholders in the nature of dividends, as may seem best. The whole point in the discussion is whether it is best to set aside a certain amount for depre ciation, or to pay all earnings out in dividends, and I would, therefore, reiterate another statement made in the paper, to the effect that in order to insure its right to live a company should provide from its current earnings, a fund sufficient to coyer all cost of property by the time such property was depleted. In the discussion, I made the incomplete remark that I did not think it made any difference whether a company was one which owned one mine or plant, or whether it embraced several mines or plants. This remark should have been completed by adding that the principle mentioned in the paper should apply if the companies expected to conduct a continuous business, or whether the depletion of the one mine or plant should wind up their affairs. If a company in the mining business, for example, intends to conduct that business for an indefinite period, it should provide from its earnings a fund which should be equal, by the time existing mines were depleted, to the investments in such mines, which fund would be an asset, either in cash or in investments in new properties. Such new properties, if the fund were disposed of in purchasing new properties, would make earnings, and stand a like depreciation or charge for further additions to take their place as they were worked out. If it were decided not to make any new purchases, the fund could be distributed in the way of dividends to the stockholders. If the working out of the one mine owned by a company were to finish that company's business, it would be unnecessary to set aside a depreciation charge, but all the earnings could go as dividends to the stockholders.

"The whole question, to my mind, hinges on whether a company intends to continue in business or not. If no depreciation were provided, and all the earnings were paid in the way of dividends to the stockholders, an assessment would have to be made on stockholders when it was found necessary to extend the work or provide new properties. Depreciation, therefore, is a continuous provision from current operation, to keep the business on a continuous basis.

"Mr. M. M. Kirkman, in Volume III of the Science of Railways, devotes a chapter to the particulars of sinking funds. I quote the following from this chapter: 'In reference to the treatment of sinking funds in the accounts. they are in the nature of unrepresented capital. A sinking fund takes the place of obligations that at one time represented cost. It has, therefore, the same rights as the original investment; the right to be represented by bonds or shares. It is not chargeable against income account any more than any other capital expenditure. The reason why we so often find it included in the income account is because of the conservatism of proprietors. It is another way they have of strengthening their properties. It is similar in effect to making improvements with net earnings. While the practice appears to trench on the rights of stockholders, it is not to be hastily condemned. The fact that it is done by sagacious and practical business men is, in itself, sufficient evidence that it is proper.'

"In following this matter up, I also find an interesting and valuable discussion of this subject in 'Mine Accounts and Mine Bookkeeping,' by J. G. Lawn. Lawrence R. Dicksee, professor of accounting at the University of Birmingham, in his book on 'Auditing,' also writes interestingly on this subject."

The Ball Engine Co., Erie, Pa., has sold the Dundee Textile Co., Passaic, N. J., a 175-h. p. direct connected unit.

ELECTRIC TREATMENT OF MAGNETIC ORES.

At the fourth general meeting of the American Electrochemical Society at Niagara Falls, N. Y., on Sept. 17-19, Marcus Ruthenberg, of Philadelphia, gave some additional memoranda concerning the work he has been carrying on at Lockport, N. Y., employing his process for treating magnetic ores too fine to be worked in the blast furnace. Mr Ruthenberg's apparatus, which has been frequently but erroneously referred to as an electrical furnace, consists of a horizontal horseshoe magnet, hinged so that its poles may be approached. The poles are surrounded by water-cooled bronze rolls covered with carbon plates, which rotate in opposite directions. An electric arc is formed and this subjects the fine ore, as the latter is passed through the arc, to a high temperature. The ore is fused into lumps which are carried by the revolution of the rolls out of the magnetic field and drop into a receptacle. From the latter the fritted ore may be taken to the blast furnace; but a later method is to reduce it directly in a soaking pit into which the agglomerated ore drops from the rolls. Gases—carbon monoxide or hydrocarbon—are passed through the mass of hot ore in the soaking pit. Emphasis is laid on the fact that during the exposure of the ore to the action of the electric arc much of the sulphur in the ore is eliminated.

In his brief paper at Niagara Falls, Mr. Ruthenberg made the following statement as to the latest developments in connection with his process. It would appear from this that at ¼ cent per k. w.-hour for the electric current, the charge for converting the ore into the fused lumps that drop from the rolls into the soaking pit is 62½ cents.

"The truth of the blast furnace is that it is a highly economical device for accomplishing its end and will continue to be so until methods be found that will perform its functions for less money. However, some classes of ore may now be more cheaply reduced to metal by other means than the blast furnace, making a product whose analysis cannot be produced in the blast furnace at all. Given a magnetic ore carrying gangue, sulphur, and phosphorus in prohibitive quantity for making good steel economically, such ores find no market tributary to the blast furnace. On the other hand such ores may be crushed, magnetically concentrated, electrically smelted and produce the best of steel at a price which can compete with an ideally situated blast furnace.

"It last year's paper I made the assertion that 'the work of the electric furnace was performed upon a ton of ore with something less than 500 k. w.-hours of energy.' Today I am prepared to report to you that I am doing the same, but better work, with one-half the energy.

"Three problems have presented themselves for solution, in the conduct of my work; first, the power required to agglomerate and sufficiently heat for subsequent reduction: second, the regulation of the size of the agglomerated particles; and third, the amount of reduction of the agglomerated material. The status of those three problems today is that a ton of ore is being agglomerated with an expenditure of about 250 k. w.-hours; the size of the product is under perfect control; the reduction is being made absolute. Inasmuch as the only function of the electric current is to agglomerate the dusty particles into coherent masses without binder or flux, and to convey a sufficient quantity of heat to the ore in the soaking pit, to permit the reducing agents to perform their functions, it will be readily comprehended that the heat and current losses due to maintaining a molten mass are lacking."

The Great Lakes Engineering Works, Detroit, Mich., report a very satisfactory demand for their improved "semi steel" propeller wheels. Among recent orders are wheels for the car ferry Shenango No. 2, Homer Warren, Atlantic coast seagoing dredge Atlantic, American Eagle, Byron Whitaker, Ida E., tug Alpha, V. H. Ketcham, and tug C. L. Bovnton. Their business in this and other lines has shown a marked and continuous monthly increase.

New Horizontal Boring, Drilling and Milling Machine.

The machine illustrated below attracted much attention at the machinery exhibit at the recent Fall Festival in Cincinnati and is manufactured by the Fosdick Machine Tool Co., of that city. It will perform the various operations of boring, drilling, tapping, reaming, facing, milling, etc., on both light and heavy work with great economy and is accurate and rapid in the different operations and adjustments. All of the operations mentioned can be performed on a piece of work fastened to the table in the one setting, insuring the most precise and profitable results. The halftone shows a well proportioned design. The other views are reproduced from the working drawings.

The machine is driven by a spindle shaft which carries the belt cone on the rear of bed. The column, carrying the spindle head, has horizontal movement on the bed by hand or power in both directions, also a quick forward and return motion by power and is operated by the hand-wheel conveniently located on the front of the bed. The spindle head, which is counterbalanced and provided with a safety chain, has a vertical movement on the column by hand or power in both directions and for quick adjustment is operated through a rack and pinion with ease by means of the pilot wheel seen on front of the spindle head. The spindle runs in adjustable bronze bearings and has a thread cut on the front end to receive chucks, large milling cutters, facing heads, etc., for very heavy work; it revolves in right or left hand directions by operating the reverse lever; this is very convenient for facing, tapping, milling and other operations.

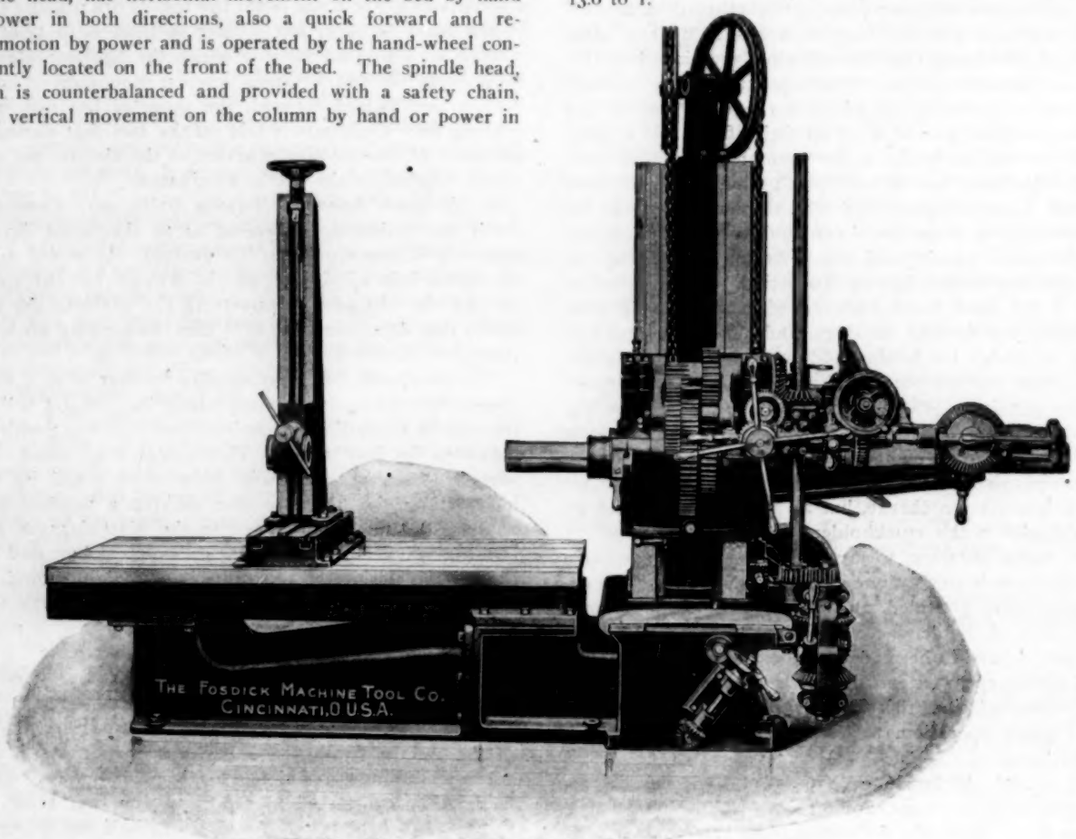


FIG. 1.—HORIZONTAL BORING, DRILLING AND MILLING MACHINE.

The spindle bar which passes through the spindle is 4 inches in diameter, has 22 inches traverse and is fitted with a No. 5 Morse taper to receive shanks of drills, taps, reamers, boring bars, milling cutters, etc.; it has power and hand feed in both directions, is operated from the pilot wheel for quick adjustment, and can be securely clamped for face milling purposes. For very heavy work the cutter or boring bar is secured by a cotter fitted to the spindle bar.

The back gears are located on the spindle head applying the power direct to the work, thus relieving the outer shafts from unnecessary strain and reducing the vibration of the cutting tools to the minimum. The lever for operating the back gears is conveniently located on the spindle head and the gears can be engaged or disengaged while the machine is running.

The outer support for the boring bar can be clamped securely to the table, has horizontal and vertical adjustment, and is provided with graduated steel rules, as are also the face of the column and the bed, the spindle sleeve being graduated as well. The table in which the "T" slots are planed is stationary and securely bolted to the bed and base, insuring perfect alignment of the work.

All the feeds, as the horizontal feed of column, horizontal feed of spindle bar and vertical feed of spindle head, are taken from the spindle; they are positive geared, eight in number, worked by hand or power and are arranged in geometrical progression from 7/1,000 inch to ¼ inch per revolution of spindle. All the feeds are reversible. The spindle speeds are ten in number, arranged in geometrical progression from 4 to 260 r. p. m.

The gear ratio from the cone driving shaft to spindle is 2 ⅔ to 1; that is, when the driving shaft makes 2 ⅔ revolutions, the spindle makes 1. The ratio of the back gears is 13.6 to 1.

The leading specifications are as follows: Diameter of spindle bar, 4 inches; diameter of spindle nose, 6 inches; traverse of spindle, 22 inches; vertical adjustment of head on column, 36 inches; horizontal adjustment of column on bed, 32 inches; maximum distance table to center of spindle, 44 inches; minimum distance table to center of spindle, 7½ inches; height of table from floor, 22 inches; size of table, 31 inches by 72 inches; tight and loose pulley on counter shaft, 16 inches by 4 inches; width of belt on cone, 3½ inches; total height of machine, 8 feet; net weight, 12,000 pounds.

On application of the Long Arm System Co., of Cleveland, Judge Kirkpatrick of the United States Court, at Newark, N. J., on Oct. 17 appointed James Smith, Jr., receiver of the Crescent Shipyard Co. The Crescent Co., is a subsidiary concern of the United States Shipbuilding Co., of which Mr. Smith is receiver.

Orders have been issued calling for a reduction of the working hours in the car repair and locomotive shops of the Lake Shore Railroad, from 10 to 9 hours. This brings a corresponding reduction of wages. These orders follow the recent reduction of the working force by 15 percent.

PRODUCTION OF ABRASIVES IN 1902.

The United States Geological Survey report on the "Production of Abrasive Materials in 1902" is by Joseph Hyde Pratt. The portions relating to corundum and emery and to the production of artificial abrasives are of special interest, and we make extracts below:

Corundum and Emery.

There is a constant increase in the demand for such abrasives as corundum and emery, which is due to the large increase in manufacturing, especially of agricultural machines, and also to the improved methods that have been devised for manufacturing emery and corundum stone and wheels of all shapes and sizes. That the supply could readily exceed the demand is very evident when it is considered that there are only about 16,000 tons of corundum and emery used in the United States. Of this amount, however, about 10,000 tons are imported, so there is room for a large increase in the domestic production of these abrasives. At the present time there are less than 500 tons of corundum used; this is not due to the small demand for it, but to the lack of this material on the market. If the price is maintained at 8 to 10 cents per pound there will be a relatively small amount of corundum used; but with a slight decrease in price there will be a great increase in the use of corundum, which will be at the expense of the emery. At the same time, with a decrease in price, the more favorable must be the location of the deposits for mining and for railroad facilities in order to bear the competition with the emery. With the known occurrences of corundum in the United States there should be no difficulty in such production of it as fully to satisfy the market's demand.

In the North Carolina corundum fields there was no production of this mineral during 1902. The North Carolina Corundum Co., which was carrying on development work in 1902, expects to become a producer in 1903. These deposits are on Buck creek, Clay county, associated with the largest peridotite area in the Southern Appalachians. There has been one find made in this section of a mass of solid yellow corundum weighing 125 pounds. The company is equipping the property with machinery for mining, cleaning, and preparing the corundum for market.

The Montana corundum deposits were producers of crude corundum ore to the extent of about 325 tons, most of which, however, is still lying on the dump. During January, 1903, about 25 tons were cleaned, but none was placed on the market, mainly on account of unfavorable freight rates. A favorable rate to Chicago has now been obtained, and the Montana Corundum Co. is now (July, 1903) producing corundum at the rate of 800 to 1,000 tons per year. The commercial product has been tested by a number of users of this abrasive, and they have reported favorably regarding it. The Bozeman Corundum Co. has been developing its property about 14 miles southwest from Bozeman. The corundum veins vary from a few inches to 3 feet in thickness, and are being exploited by means of shafts and drifts. About 5 miles west of the Montana Corundum Company's mine is the Anceny corundum deposit, which promises to develop into a property containing a large quantity of corundum.

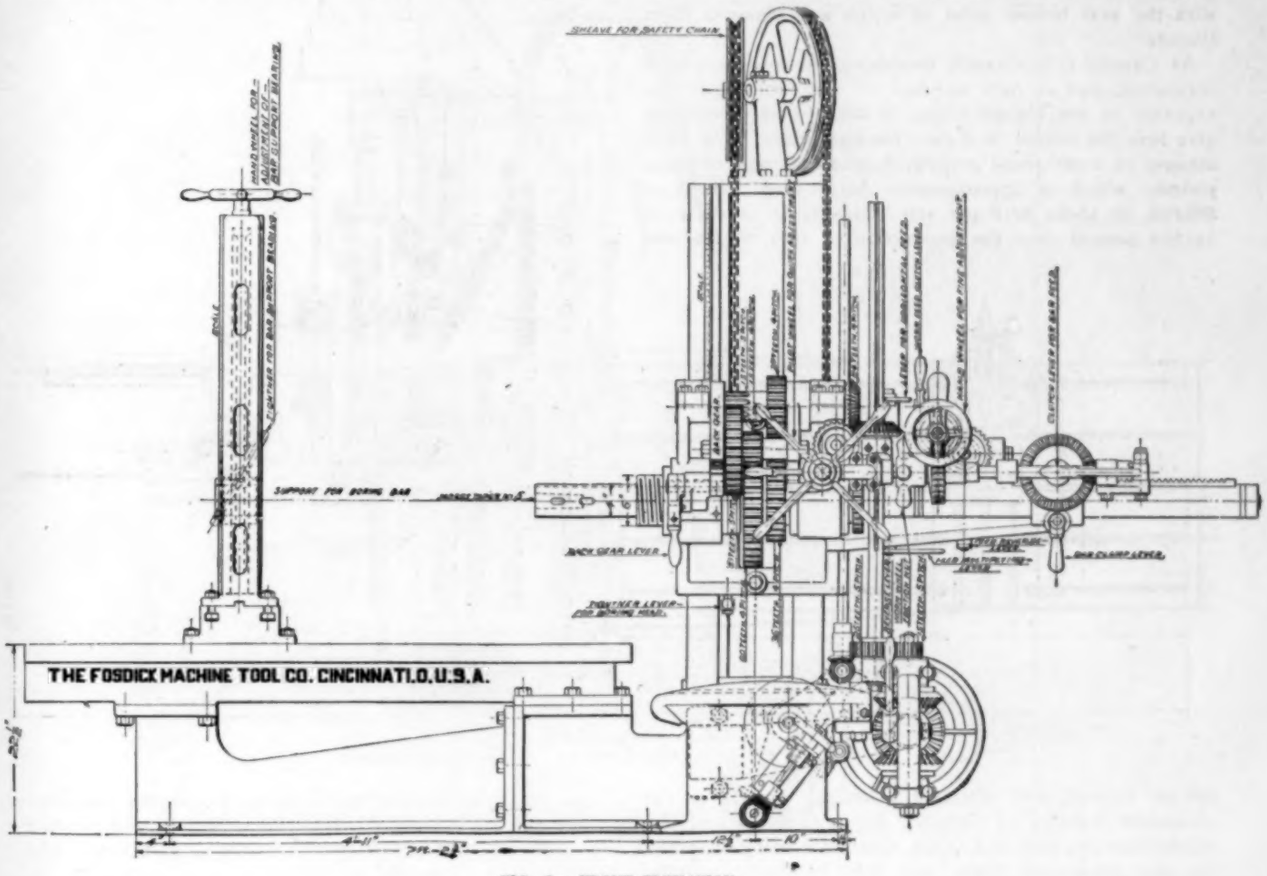


FIG. 2.—FRONT ELEVATION.

A recent discovery has been made of corundum in Connecticut, which has been described by Prof. B. K. Emerson. It occurs in Litchfield county, near Barkhamsted, but does not give any evidence of occurring in commercial quantity.

The deposits of corundum occurring in serpentine near Spanish Peak, California, described in the report for 1901, have been described in detail by Prof. Andrew C. Lamson. He considers the rock as a new type, to which is given the name "plumasite."

The Canadian corundum deposits have continued to be operated during 1902, and the larger part of their production has been shipped to this country. The total production was nearly double that of 1901.

In 1902 the production of corundum in the United States was almost entirely of the emery variety. The production of emery was confined to the same localities as the year

before—the mines at Chester, Mass., and those in the vicinity of Peekskill, N. Y., there being an increase in the production from the latter locality and a large falling off in the production from the Chester mines. The quantity of emery produced did not come up to what was expected. The total quantity of corundum and emery produced during 1902 was 4,251 short tons, valued at $104,605, a decrease of 54 tons, and of $41,435 in value, as compared with the production of 4,305 tons, valued at $146,040, in 1901. There was also a large falling off in the imports of emery and corundum for 1902.

In 1881 the production of corundum and emery in the United States was 500 short tons; in 1889, 2,245 tons; in 1894 it had fallen to 1,495 tons; in each of the three following years about 2,100 tons each; in 1898, 4,064 tons; in 1899, 4,900 tons.

There was a large falling off in the imports of corundum and emery in 1902, which amounted altogether in value to $214,842, as compared with $294,999 in 1901, a decrease of over $80,000 in value. There was, however, a decided increase in the importation of corundum as compared with the year before, most of which was obtained from Canada.

As Canada is constantly increasing her production of corundum, and as over one-half of this production was exported to the United States, it may be of interest to give here the output of these Canadian mines. The total amount of commercial corundum produced was 1,611,200 pounds, which is approximately 805½ tons, valued at $88,616, or about $110 per ton. This is an increase of 742,610 pounds over the production of 1901, which was

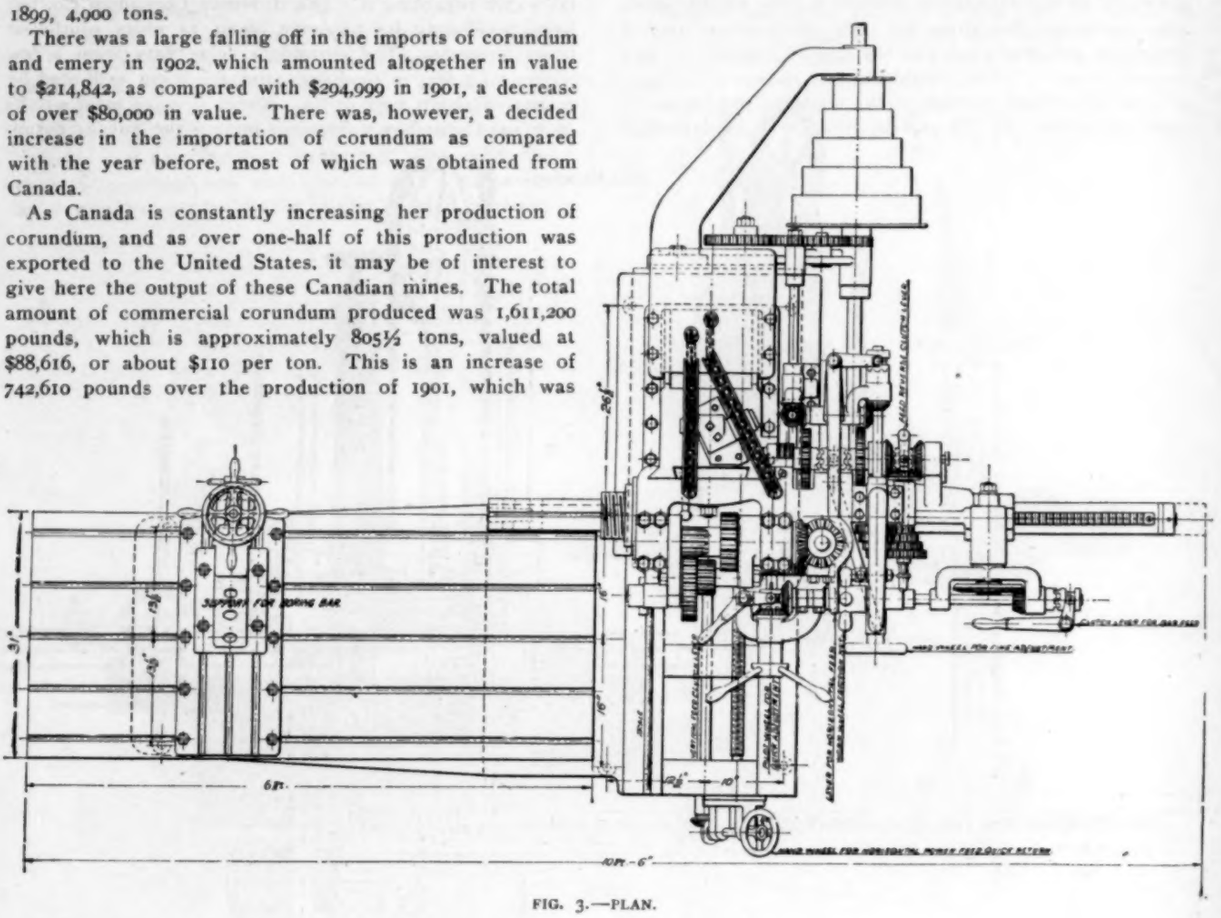


FIG. 3.—PLAN.

868,590 pounds, and indicates a healthy growth in the corundum industry of Canada. But a small part of this production was sold in Canada, most of it being exported. Of this production there was sold in Canada 211,887 pounds, in England 176,342 pounds, in other parts of Europe 362,554 pounds, and in the United States 784,947 pounds.

Artificial Abrasives.

There was a slight decrease in the amount of carborundum produced in 1902 as compared with that of 1901, which was due to interruptions during the early part of 1902 in the Carborundum Co.'s supply of electrical current and the inability of that company during the latter part of the year to obtain a sufficient supply of raw materials—a result of the anthracite coal strike. If it had not been for these obstacles the production would have been considerably increased over that of 1901. It amounted in 1902 to 3,741,500 pounds, a decrease of 96,675 pounds, as compared with the production of 3,838,175 pounds in 1901. This is the first year since carborundum began to be manufactured that there has not been a large increase over the production of the year before. In 1903 there will undoubtedly be a large increase over last year's production. Much of the carborundum that is manufactured is now exported. The value of the carborundum varies from 8 to 10 cents per pound.

In the following table is given the production of carborundum since 1892, when it was first put on the market:

PRODUCTION OF CARBORUNDUM, 1892-1902.

Year.	Amount. Pounds.	Year.	Amount. Pounds.
1892	1,000	1898	1,447,200
1893	15,200	1899	1,741,245
1894	52,200	1900	2,634,900
1895	226,000	1901	3,838,175
1896	1,207,800	1902	3,741,500
1897	1,256,400		

The production of crushed steel by the Pittsburg Crushed Steel Co. in 1902 was close to that of the last two years, and amounted to 735,000 pounds, as compared with 690,000 pounds in 1901. The value of this product is 5½ cents per pound free on board at Pittsburg. The table below shows the production of crushed steel for the last five years.

PRODUCTION OF CRUSHED STEEL IN THE UNITED STATES, 1898-1902.

Year.	Amount. Pounds.	Year.	Amount. Pounds.
1898	660,000	1901	690,000
1899	675,000	1902	735,000
1900	700,000		

The production of crushed steel, which is used largely by the building trades, is apt to fluctuate with their condition. New uses are being found for the different grades of crushed steel, and some grades are meeting with considerable success. The finer grades of crushed steel, known as "steel emery" and "rouge," are used in considerable quantity by the glass trade.

The manufacture of artificial corundum from bauxite, which was recently started by the Norton Emery Wheel Co., has been carried on by that company at its plant at Niagara Falls during most of the year 1902. Thus far its manufactured product has been used entirely by the company itself, and none has been put on the market as raw

material. This artificial corundum is reported to give very good satisfaction, and the company expects in the near future to produce this material to the full capacity of the plant. It will then undoubtedly be put on the market.

Adamite.

Another artificial abrasive that has recently been introduced to the market is adamite, which at the present time is being manufactured at Vienna, Austria, and is handled in this country by the Adamite Abrasive Co., which crushes and grades the raw material received from Germany at its plant at North Tonawanda, N. Y. The company intends in the near future to erect a plant at North Tonawanda to manufacture the adamite. This material makes a hard and tough abrasive, but no comparative tests as to its abrasive efficiency are as yet available. It breaks with a rough fracture, which is favorable for sustaining a good cutting edge.

The Vulcan Detinning Co., New York, has passed the dividend on its common stock and reduced the dividend on the preferred stock to 1 per cent. The company was formed in April of last year, and acquired the plant of the Vulcan Metal Refining Co., of Sewaren, N. J., and the Vulcan Western Co., of Streator, Ill. Its business is the refining of metals and the reclamation of merchantable tin bars and steel from the scrap tin left after the manufacture of cans and hollow ware. It is capitalized at $3,500,000—$2,000,000 common and $1,500,000 preferred. A circular to the stockholders state that on July 17 the plant at Streator was almost totally destroyed by a cyclone. Reconstruction work was completed Sept. 21, since which time the plant has been in full operation. This drew very heavily on the company's resources, but has been paid for without incurring any indebtedness.

The new reorganization plan of the International Fire Engine Co. provides for cutting down the capital stock from $9,000,000 to $3,000,000 and the creation of a voting trust. The common stock will be practically wiped out and there will be an issue of $1,000,000 in bonds.

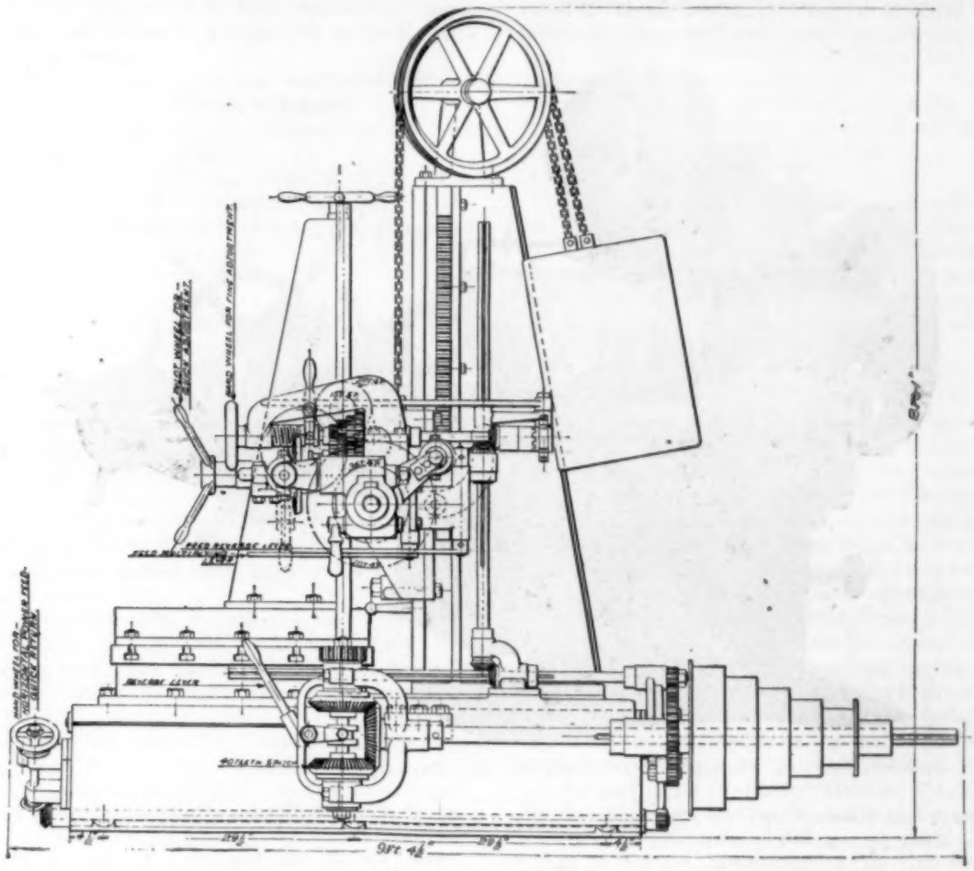


FIG. 4.—END ELEVATION.

CRUCIBLE STEEL CO. OF AMERICA.

At a meeting of the board of directors of the Crucible Steel Co. of America, held last week, a reorganization was effected by the election of William G. Park as chairman of the executive board. After the meeting the following statement was given out:

By reason of the failure of consummation of the sale of the Clairton Steel Co. property, under the contract which had been executed between the Crucible Steel Co. and the United States Steel Corporation, and which the officers of the Crucible Steel Co. had every reason to believe up to the last moment would be carried out, it became necessary to obtain additional funds as working capital for the purpose of operating the Clairton plant and taking care of its indebtedness.

At a meeting of parties interested sufficient subscriptions have been obtained to effect this purpose.

It has also been considered advisable to effect a reorganization of the officers of the company, and it has been arranged to have William G. Park become chairman, in full control, so that the reorganization will show the following officers:

William G. Park, chairman; Frank B. Smith, president and general manager; Reuben Miller, first vice president; Herbert DuPuy, second vice president; Robert E. Jennings, third vice president; Julius Bieler, treasurer; Alexander Thomas, secretary.

Executive committee—W. G. Park, Reuben Miller, Herbert DuPuy, W. P. Snyder, James H. Park, A. W. Mellon, Frank B. Smith.

It is probable that the larger operations of the Clairton Steel Co. may require the company to discontinue the dividends on the preferred stock. If this proves to be so the directors will not hesitate to suspend dividends while this necessity exists.

CRUCIBLE STEEL CO. OF AMERICA,
Frank B. Smith, President.

Wm. G. Park was president of the Park Steel Co., whose Black Diamond Steel Works, Pittsburg, were taken over by the Crucible Steel Co. of America. James H. Park, formerly of the same company, which was originally Park Bros. & Co., Ltd., has been a vice president and a director of the Crucible Steel Co. of America.

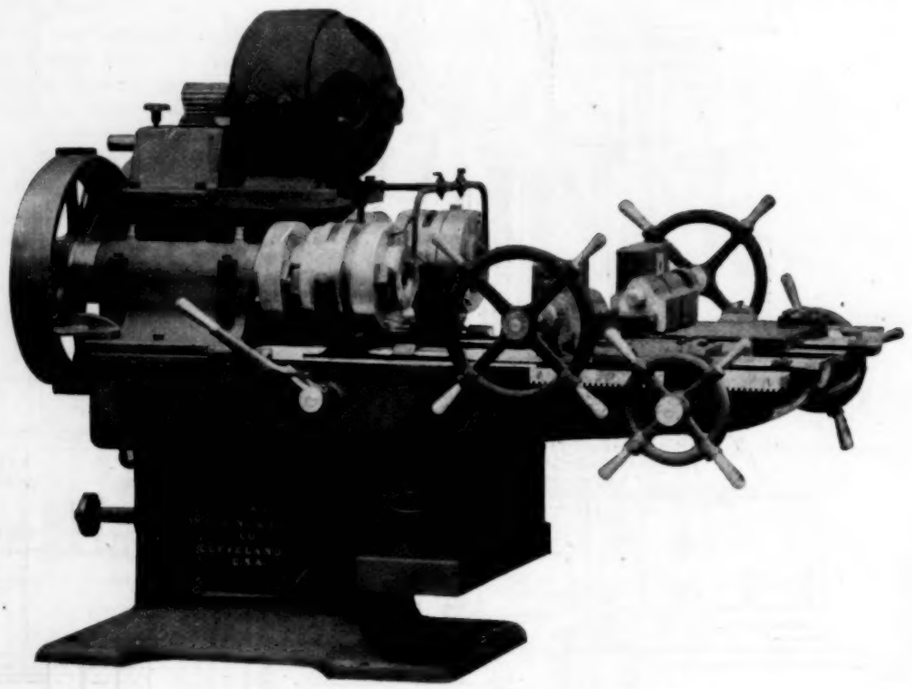
The four-mill plant of the American Tin Plate Co., Cambridge, O., was shut down last week and will be immediately dismantled. The mills will be removed to other plants of the company which are more favorably located. This plant has been making only black plates for some time.

MOTOR-DRIVEN DOUBLE BOLT CUTTER.

The type of double bolt cutters with motor drive as brought out by the Reliance Machine & Tool Co., of Cleveland, is shown herewith. With the exception of the belt pulley (this being replaced by the motor) this machine is in all its details the same as the makers' standard machine. The motor is placed between and above the head stocks of the machine, absolutely free from oil and chips and occupying no valuable floor space.

The specifications for the machine, which was primarily built for the Navy Department, called for an exceptionally wide range of speed, and novel means were devised to meet these conditions. A three-horsepower reversible variable speed motor was employed, giving a speed variation in the proportion of 3 to 8. A nest of gears placed between the pinion on the motor shaft and the main pinion of the machine increases this ratio to 1 to 6. By means of a controller in connection with the motor, eighteen spindle speeds are obtained.

This arrangement proves to be very satisfactory and is adopted by the company as the standard motor drive for double bolt cutters. While in this particular case a Crocker-Wheeler motor and Cutler-Hammer controller were used, the manufacturers furnish any standard electrical equipment and connect either by direct gearing, belt or silent chain.



TWO-INCH BOLT THREADING MACHINE WITH MOTOR DRIVE.

Open-Hearth Furnaces at Pueblo.

The making of open-hearth steel has been successfully started at the Pueblo plant of the Colorado Fuel & Iron Co. The Garrett-Cromwell Engineering Co., Cleveland, has received a telegram announcing that last week the four new open-hearth furnaces at Pueblo made 64 heats and turned out 3,328 tons of steel. This is almost up to the records of established plants and is considered a remarkably good showing for new furnaces, reflecting credit on J. A. Durfee, formerly of the Ohio Steel Co.'s plant, Cleveland, and now superintendent of the open-hearth department at Pueblo. The new 40-inch blooming mill has also made some excellent records recently. On Sept. 23, in a 12-hour turn, 473 tons of 4-inch billets were rolled.

The blast furnace of the National Steel Co., at Zanesville, O., has been blown out for an indefinite time. It is the general belief in that city that the plant will never again be in operation. It consists of a stack 75x16 feet, built in 1870 and rebuilt in 1883. Its annual capacity is 65,000 gross tons.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

Battey Machinery Co., Rome, Ga., is in market for two 150-h. p. second-hand return tubular boilers.

W. A. Mulcahy, 237 Carroll St., Woodberry, Baltimore, Md., asks prices on 35-h. p. horizontal engine and 30-h. p. vertical boiler.

The Seaboard Product Co., Georgetown, S. C., wants locomotive boiler, 60 to 80 h. p., elevating and conveying machinery.

The Davis Expansion Boring Tool Co. has been incorporated at St. Louis, with capital of $20,000, by Emery M. Davis, Alexander Landan and others for the manufacture of tools and machinery.

George T. Gifford, G. W. Gifford and John A. Ritchie have incorporated the George T. Gifford Iron Works Co., at Tifton, Ga., with capital of $6,000, for conducting foundry and machine shop business.

The Emporia Machine Co., Emporia, Va., with authorized capital of $5,000, has been incorporated, with C. L. Vincent president.

Wm. Minnigerode, Lynchburg, Va., has leased old railroad machine shop, roundhouse, etc., at Durmid, Va., and will equip for general machine repair work.

The Bryant Steel Co., has been incorporated under the laws of New Jersey with a capital stock of $200,000. The company will engage in the manufacture of steel wheels at Columbus, O. The incorporators all of whom are from Columbus, are: C. M. Henley, H. H. Zeigler, Joseph Ellis, and E. C. Waters.

A new company has been formed at Palmyra, N. Y., under the name of the Empire Folding Machine Co., for the manufacture of folding machinery. The plant is located on Jackson Ave., and will start business with a full equipment in the near future.

The George West Steel Bridge Co., Parkersburg, W. Va., has been incorporated with a capital of $100,000, to build and construct bridges of iron, steel and wood. The incorporators are: J. N. Camden, S. W. Goff, J. H. Fischer, C. C. Martin, W. W. Jackson, E. L. Davidson, W. W. Walker, Parkersburg.

The E. G. Hicks Gasoline Engine Co., Minneapolis, Minn., has been incorporated with a capital of $10,000. The incorporators are: Eliphale G. Hicks, Daniel O. Pease, Frederick

B. Pease and George Bierlein, all of Minneapolis.

The Palmer Oil Engine Co., Detroit, has been incorporated with a capital of $15,000.

The Rentfro Iron Works, New York, has been incorporated with a capital of $50,000. The directors are: Rentfro B. Banton and Manton Moore, New York; H. H. Hall, Brooklyn.

The Trussed Concrete Steel Co., Detroit, has been incorporated with a capital of $200,000.

The Central Foundry & Car Co., Irwin, Pa., has been incorporated with a capital of $25,000.

The International Boiler Cleaner Co. was organized at Wichita, Kan., a few days ago with the following officers: A. Dudley Blanton, president; Wm. Walterscheid, vice president; Charles Walterschied, treasurer; Astley Cooper, secretary; and I. P. Campbell, attorney. The capital stock is $10,000, paid up.

The Cincinnati Metal Sign Co., Cincinnati, Ohio, capital $50,000, has been incorporated by Guido Gores, Chas. E. McCarthy, Carl L. Harrison, Edward A. Ferguson and Louis A. Ireton.

The Automatic Valve Grinding Machine Co., capital $200,000, has been incorporated at Knoxville, Tenn. Among those interested are: Alex. McMillan, Alex A. Scott, Flem Hazen, and P. J. Briscoe.

The Sun Stove Co., of Detroit, has filed a certificate of an increase of capital from $100,000 to $150,000.

The Earle Gear & Machine Co., Philadelphia, has been incorporated with a capital of $40,000.

The Mohawk Stove Co., Palatine Bridge N. Y., has been incorporated with a capital of $150,000. The directors are: H. A. Shafer, Palatine Bridge; F. W. Bauder, Fort Plain; and O. O. Stillman, New Brunswick, N. J.

Fires and Accidents:—

The building of Boll Bros., Harrisburg, Pa., manufacturers of iron and brass bedsteads, was completely destroyed by fire Oct. 12, involving a loss of $100,000, partially covered by insurance.

A 20-inch brick wall, 70 feet high, a part of the new foundry of the Filer & Stowell Co., Milwaukee, Wis., was blown down recently. The loss was about $2,000, which falls upon the contractor.

One man was killed and three others overcome by gas at the plant of the Mahoning Foundry & Machine Co., Oct. 16. A piece of iron became wedged in the cupola and the workmen were trying to remove it.

On Oct. 8 fire destroyed the machine shop and damages the foundry of Robbins and McGehee, at Live Oak, Fla. The foundry will be rebuilt and started at once, but it will take several weeks to rebuild the machine shop. The loss is estimated at $6,000.

The foundry of Whitehurst & Co., Norfolk, Va., was slightly damaged by fire on Oct. 7.

The foundry of the Keyless Lock Co., of Indianapolis, Ind., was damaged to the extent of $5,000 by fire recently.

The plant of W. B. Berteis & Son, of Wilkesbarre, Pa., manufacturers of tin ware, was totally destroyed by fire Oct. 16. The fire was caused by an explosion. One workman was fatally injured. The loss is $100,000.

The buildings and machinery of the Electric Lighting Co., Thomaston, Conn., were destroyed by fire Oct. 12. Loss, $25,000.

New Construction:—

It is expected that the new plant of the National Steel Foundry Co., New Haven, Conn., will be completed shortly after the first of December. The contract for the building has been let to the McClintic-Marshall Construction Co., Pittsburg.

The Chattanooga shops of the Cincinnati Southern & Alabama Great Southern railroads are to be enlarged and the present working force and capacity are to be doubled. Three hundred additional workmen will be employed.

The Van Dorn Iron Works Co., Cleveland, has begun working on the superstructure of its new building, which will be 178x81 feet.

Contracts have been let by the Sessions Foundry Co., Waterbury, Conn., for a pattern storage building, 120x50 feet, to be of brick, and four stories high. Rapid increase of business has made more room for storage purposes imperative.

The Chicago Malleable Co. has begun the construction of a brick building on 120th and Loomis streets, West Pullman, at a cost of $30,000.

John R. Mitchell will erect a one-story machine shop 27x30 feet at 702 South Washington St., Baltimore, Md.

On account of the rainy weather which prevented outside work for many days, the progress at the new shops of the Rock Island Railroad at Moline, Ill., has been hindered, and it will not be completed as soon as expected. It is expected, however, that by Jan. 1 the shops will be in partial operation, employing about 700 men.

Many improvements have been made at West Allis, Wis., during the year. In addition to the immense plant of the Allis-Chalmers Co., there are six large manufacturing plants on the line of belt railroad. The Milwaukee Electric Co., Prescott pump works, the Chain Belt Co., Kearney & Trecker and the Shaw Foundry Co., employ about 5,000 men and are steadily operated.

The South Bend Foundry Co., South Bend, Ind., is moving its office to Indiana Ave., making room for contemplated additions to its foundry buildings.

The Rock Island Railroad contemplates making extensive additions to its shops at Chickasha, I. T. The new shops are to be double the size and capacity of the present plant. It is expected that the new construction will be finished by Jan. 1. The new shops will not only repair rolling stock, but will turn out new cars.

The Huntington Railway Co., operating a system of traction railways from Los Angeles, Cal., will double the capacity of its present shops, spending nearly $300,000. The site will have a frontage of 700 feet. There will be headquarters for the superintendent, reading rooms for the trainmen, store rooms, machine shops, blacksmith, repair and paint shops and a car building shop.

G. H. Lincoln & Co., iron founders, South Boston, Mass., will build an addition to their foundry, 40x30 feet.

When the Great Northern Railroad places its new car shops in St. Paul, Minn., in active operation next month, it will have one of the most extensive car and locomotive buildings and repair plants in the West. Fully $1,000,000 has been expended. The buildings include machine and erecting shop, 150x600 feet; boiler shop, which has a floor area of 61,000 square feet; the blacksmith shop, with its 40,000 square feet area; storehouse, 452x100 feet; office building and laboratory, and several smaller blildings. Electric power and compressed air are used to the greatest possible extent. The machine tools are driven by electric power, and for the hoists, hand tools, hammers and calkers compressed air will be used. Nearly all the machine tools are driven by individual motors. Power will be furnished from the central powerhouse, from which tunnels run to the different buildings.

J. N. Cook and J. T. Barnett, Orlando, Fla., are erecting a shop building, and will install machinery for general repairing work.

John W. George, of Cumberland, Md., has the contract to build a power house for the Frostburg Illuminating & Mfg. Co., Frostburg, Md. The building will cost $6,500.

Tieterman & Bagley, Tacoma, Wash., will erect a foundry building, 40x24x10 feet.

The Union Ice Co., Philadelphia, will erect a two-story stone and brick boiler house, with an office building adjoining, and a machine shop in the rear. The cost will be about $50,000.

The Canadian Westinghouse Co., Ltd., recently organized with a capital of $2,500,000, will begin work within a week or two on its new plant at Hamilton, Ont. It is expected that at least 1,000 employes will be serving the company within a year, as soon as the plant is completed.

The Van Buren, Heck & Marvin Co., of Findlay, O., has purchased a five-acre tract of land on the T. & O. C. and Lake Erie Railroads and will erect new buildings at once. The machine shop is to be 150x250 feet, and the foundry, 60x80 feet. The company will also erect an office building.

Platteville Foundry Co., of Platteville, Wis., is pushing work on its new plant as rapidly as possible and expects to have several of the buildings enclosed before snow falls. The

company intends to manufacture mining machinery of all classes. The equipment of both foundry and machine shop will be complete and has been ordered at Chicago and Eastern points.

The Canadian Shoe Machinery Co., at St. Hyacinthe, Can., is about to erect a foundry at its plant. The company has been reorganized and increased its capital stock from $1,000,000 to $2,000,000.

The Pittsburg and Valley Districts:—

The rail mill, Bessemer plant, and the two furnaces of the Ohio plant of the Carnegie Steel Co., Youngstown, O., which have been in operation without interruption since the first of the year, are idle this week. It is probable, however, that the furnaces will resume on Saturday night and the steel works next Monday. Stack No. 3 of this plant has been out for some time, receiving a new lining. The new furnace, to be known as No. 4, will not be ready for operation before next February.

Owing to the large amount of repair work to be done at the Shenango plant of the American Tin Plate Co., New Castle, Pa., it is probable that operations will not be resumed on Nov. 1, as anticipated. It is reported that operations may not be resumed before the first of the year.

The Thomas stack of the Carnegie Steel Co., Niles, O., was blown out last week for a short period. No date has been set for relighting the stack.

The Colonial Steel Co. will transfer a portion of its clerical force from its offices in the Keystone Bank Building, Pittsburg, to the works office at Colonia, Pa.

Ten of the hot mills of the South Sharon, Pa., plant of the American Tin Plate Co. are idle this week. It is not known when they will resume operations.

Six of the idle hot mills at the Demmler plant of the American Tin Plate Co., McKeesport, Pa., which have been idle for several weeks, resumed operations on Monday of this week. The remainder of the plant will be placed in operation shortly.

The puddlers employed at the plant of the Moorhead Bros. Co., Sharpsburg, Pa., went on a strike last week on account of the announcement that their wages would be reduced from $6 to $5 per ton. The puddling rate of the Amalgamated Association was recently reduced from $6.25 to $6 and when the next bi-monthly settlement is made it is probable there will be a still further reduction in wages.

The Lawrence Finished Steel Works Co. has been organized to operate a finishing mill in connection with the plant of the Damascus Steel Co., New Brighton, Pa. This new company, while operated separately, will finish a large portion of the steel produced by the Damascus Steel Co. In addition to installing finishing mills, the new company will erect a machine and pattern shop. The Damascus Steel Co. has decided to install an additional twelve-pot furnace.

The two stacks of the Carnegie Steel Co., at Bellaire, O., were blown out last week for an indefinite period. The Bessemer plant, which was shut down some time ago, is undergoing extensive repairs and will not resume operations for some time.

One of the two furnaces of the Clairton Steel Co., Clairton, Pa., is out for repairs. Work on the third stack is progressing and it is believed that it will be blown in about the first of the year.

The greater portion of the Wood plant of the American Sheet Steel Co., McKeesport, Pa., was shut down this week. No date has been fixed for a resumption of operations.

The plant of the Pope Tin Plate Co. Steubenville, O., will not resume operations until some time in November.

The Laughlin sheet mill, Wheeling, W. Va., resumed operations in all departments last week after an extended idleness. Three pots in the galvanizing department were placed in operation for the first time since they have been installed.

The rod, wire and galvanizing departments of the American Sheet & Wire Co.'s plant at Rankin, Pa., were shut down last week for repairs.

The capital stock of the Standard Pattern Co., Pittsburg, Pa., has been increased from $15,000 to $60,000, and the concern has been changed from a limited partnership to a corporate organization. Officers of the company were elected as follows: H. P. Gazzam, president; G. S. Burton, secretary; William McClain, treasurer. These officers, together with E. H. McAuley, A. E. Clifton, T. A. Munroe and Peter C. Munroe constitute the board of directors. About the first of the year the company will move its machinery from its present plant to a new building under construction at 29th and Smallman Sts., Pittsburg.

General Industrial Notes:—

Notice has been given by the referee in bankruptcy that the real estate, buildings, raw material, machinery, etc., of the Ohio Steel & Iron Specialty Co., of Cuyahoga Falls, O., will be sold at public auction on the premises on October 28.

The General Fireproofing Co., Youngstown, O., is doing a large business in herringbone expanded steel lath, made from steel sheets of gauges 26 to 28. The officers are: President, M. I. Arms; vice presidents, George D. Wick and A. P. White; secretary, W. H. Foster; assistant secretary, H. B. McMaster; general manager, W. A. Kingsley. The company also manufactures steel furniture.

R. H. Burton-Smith and Milton Perry Smith have become sole owners of the Sioux City Foundry & Mfg. Co., Sioux City, Ia., through the purchase of the interest of E. A. Bullock, of Norfolk, Neb. It is the intention of the company to increase its capital and output.

Eugene Young, for many years superintendent of the Canton Steel Co., Canton, O., will erect a plant at Canal Fulton, O., for the manufacture of patent stone crushers. He will also do a general machine business.

The Horton Mfg. Co., Painesville, O., has closed its foundry on account of the high price of labor and will hereafter buy its castings.

The Lawrence Finished Steel Works, Beaver Falls, Pa., will hereafter be operated in connection with the Damascus Steel Co., of New Brighton. The new company will finish castings and forgings made by the Damascus Co.

The Moline Scale Co., Moline, Ill., whose plant was recently visited by fire, has purchased a building in East Moline, which it will occupy. An additional building will also be erected.

Owing to an attachment for $250,000, placed on the plant of the Household Sewing Machine Co., Providence, R. I., the works have been shut down.

At the annual meeting of the stockholders of the Whiteside Wheel Co., Grand Rapids, Mich., the following board of managers was elected: Sidney B. Whiteside, J. Fred Mueller, George Clapperton, C. C. Follmer and E. D. Conger.

The force employed at the rod mill of the Minnequa plant of the Colonial Fuel & Iron Co. has been doubled. Blast furnaces A and D have been undergoing repairs for some time. Furnace A will blow in this week and furnace D will be ready next week.

The National Steel & Wire Corporation, New Haven, Conn., which also has large plants at De Kalb, Ill., and at San Francisco, has increased its capital stock from $5,000,000 to $10,000,000. The new stock issue is not to be made immediately. The company's prospects are said to be very good.

In addition to the contract for supplying the structural steel for the new Pennsylvania railroad terminal in Washington, the Pencoyd Iron Works, Philadelphia, recently received many contracts to replace bridges damaged by the recent storm in Pennsylvania and New Jersey.

The blast furnace of the Lacey-Buek Co., located at Trussville, Ala., has gone into blast and will make about 200 tons of iron daily. The furnace has been out of blast since July 3. A skip hoist has been built and the stock house greatly improved. Forty new coke ovens have been added.

The Reese-Hammond Fire Brick Co., the Curwensville Fire Brick Co., the United States Enameled Brick Co. and Hammond, Berkey & Co., all associate interests of the Reese-Hammond Co., Bolivar, Pa., are in the hands of the Westmoreland Savings & Trust Co., receiver. All these concerns are in full operation, there having been no stopping, and the business is being conducted under the direction of the receiver.

The Colorado & Southern Railroad has purchased 160 steel coke cars for the coke trade of Colorado. The cars are the first of the kind ever taken to that State. They have an automatic dump, either side or center discharge.